HONOR THE EARTH

PO BOX 63, 607 MAIN AVE, CALLAWAY MN 56521
INFO@HONOREARTH.ORG | WWW.HONOREARTH.ORG

VIA EFILING

October 27, 2020

Will Seuffert
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
Saint Paul, MN 55101-2147

Re: Petition for Investigation and Complaint of Honor the Earth of Capacity Additions to Enbridge Mainline System

Dear Mr. Seuffert:

Enclosed please find:

- the Petition for Investigation and Complaint of Honor the Earth of Capacity Additions to Enbridge Mainline System; and
- the certificate of service for the above document.

With regard to service, I have emailed counsel for Enbridge Energy, Limited Partnership, and Enbridge Inc., and also filed a courtesy copy of this document via eFiling in Docket PL9/CN-14-916, the Line 3 Replacement Project certificate of need docket.

Thank you for your time and attention.

Very truly yours,

Paul C. Blackburn

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STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION

CERTIFICATE OF SERVICE

I, Paul Blackburn, hereby certify that I have this day, served a true and correct copy of the following documents for the above captioned matters to all persons at the addresses on the attached list by electronic filing, electronic mail, courier, interoffice mail or by depositing the same enveloped with postage paid in the United States Mail at Minneapolis, Minnesota.

PETITION FOR INVESTIGATION AND COMPLAINT
OF HONOR THE EARTH

Dated this 27th Day of October, 2020.

/s Paul Blackburn
Paul Blackburn

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Michael	Ahern	ahern.michael@dorsey.com	Dorsey & Whitney, LLP	50 S 6th St Ste 1500 Minneapolis, MN 554021498	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Stuart	Alger	sta@mgmllp.com	Malkerson Gunn Martin, LLC	1900 US Bank Plaza, Sout Tower 220 South Sixth Street Minneapolis, MN 55402	Electronic Service	No	OFF_SL_14-916_Official CC Service List
Brian	Bell	bell.brian@dorsey.com	Dorsey & Whitney LLP	50 South Sixth St. Suite 1500 Minneapolis, Minnesota 55402	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Frank	Bibeau	frankbibeau@gmail.com	White Earth Band of Ojibwe	51124 County Road 118 Deer River, Minnesoa 56636	Electronic Service	No	OFF_SL_14-916_Official CC Service List
Seth	Bichler	sethbichler@fdlrez.com	Fond du Lac Band of Lake Superior Chippewa	1720 Big Lake Rd Cloquet, MN 55720	Electronic Service	No	OFF_SL_14-916_Official CC Service List
Paul	Blackburn	paul@honorearth.org		PO Box 63 Callaway, MN 56521	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Ellen	Boardman	eboardman@odonoghuelaw.com	O'Donoghue & O'Donoghue LLP	5301 Wisconsin Ave NW Ste 800 Washington, DC 20015	Electronic Service	No	OFF_SL_14-916_Official CC Service List
Christina	Brusven	cbrusven@fredlaw.com	Fredrikson Byron	200 S 6th St Ste 4000 Minneapolis, MN 554021425	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1400 St. Paul, MN 55101	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Brendan	Cummins	brendan@cummins-law.com	Cummins & Cummins, LLP	1245 International Centre 920 Second Avenue South Minneapolis, MN 55402	Electronic Service	No	OFF_SL_14-916_Official CC Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Leili	Fatehi	leili@advocatepllc.com	Sierra Club	4849 12th Ave S Minneapolis, MN 55417	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Anna	Friedlander	afriedlander@odonoghuelaw.com	O'Donoghue & O'Donoghue LLP	5301 Wisconsin Ave NW Suite 800 Washington, DC 20016	Electronic Service	No	OFF_SL_14-916_Official CC Service List
Samuel	Jackson	sam@cummins-law.com		1245 International Centre 920 Second Ave South Minneapolis, MN 55402	Electronic Service	No	OFF_SL_14-916_Official CC Service List
Rachel	Kitze Collins	rakitzecollins@locklaw.com	Lockridge Grindeal Nauen PLLP	100 Washington Ave S Suite 2200 Minneapolis, MN 55401	Electronic Service	No	OFF_SL_14-916_Official CC Service List
Patrick	Mahlberg	pmahlberg@fredlaw.com	Fredrikson & Byron, P.A.	200 S 6th St Ste 4000 Minneapolis, MN 55402	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Philip	Mahowald	pmahowald@thejacobsonlawgroup.com	Jacobson Law Group	180 East Fifth Street Suite 940 St. Paul, MN 55101	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Michael	Murphy	mmurphy@thejacobsonlawgroup.com		180 East Fifth Street Suite 940 St. Paul, MN 55101	Electronic Service	No	OFF_SL_14-916_Official CC Service List
Charles	Nauen	cnnauen@locklaw.com	Lockridge Grindal Nauen	Suite 2200 100 Washington Avenue South Minneapolis, MN 55401	Electronic Service	No	OFF_SL_14-916_Official CC Service List
Ann	O'Reilly	ann.oreilly@state.mn.us	Office of Administrative Hearings	PO Box 64620 St. Paul, MN 55101	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Joseph	Plumer	joep@whiteearth.com	Red Lake Band of Chippewa Indians	P.O. Box 567 Red Lake, Minnesota 56671	Electronic Service	No	OFF_SL_14-916_Official CC Service List
Kevin	Pranis	kpranis@liunagroc.com	Laborers' District Council of MN and ND	81 E Little Canada Road St. Paul, Minnesota 55117	Electronic Service	No	OFF_SL_14-916_Official CC Service List
James W.	Reents	jwreents@gmail.com		4561 Alder Ln NW Hackensack, MN 56452	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Akilah	Sanders Reed	akilah.project350@gmail.com		2514 Emerson Ave S Apt 7 Minneapolis, Minnesota 55405	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Janet	Shaddix Elling	jshaddix@janetshaddix.com	Shaddix And Associates	7400 Lyndale Ave S Ste 190 Richfield, MN 55423	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Richard	Smith	grizrs615@gmail.com	Friends of the Headwaters	P.O. Box 583 Park Rapids, MN 56470	Electronic Service	No	OFF_SL_14-916_Official CC Service List
Scott	Strand	SStrand@elpc.org	Environmental Law & Policy Center	60 S 6th Street Suite 2800 Minneapolis, MN 55402	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Eric	Swanson	eswanson@winthrop.com	Winthrop & Weinstine	225 S 6th St Ste 3500 Capella Tower Minneapolis, MN 554024629	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
Sara	Van Norman	sara@svn.legal	Van Norman Law, PLLC	1010 W Lake St Ste 100-130 Minneapolis, MN 55408	Electronic Service	No	OFF_SL_14-916_Official CC Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
James	Watts	james.watts@enbridge.com	Enbridge Pipelines (North Dakota) LLC	26 E Superior St Ste 309 Duluth, MN 55802	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List
David	Zoll	djzoll@locklaw.com	Lockridge Grindal Nauen PLLP	100 Washington Ave S Ste 2200 Minneapolis, MN 55401	Electronic Service	Yes	OFF_SL_14-916_Official CC Service List

STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION

Katie Sieben	Chair
Valerie Means	Commissioner
Matthew Schuerger	Commissioner
Joseph K. Sullivan	Commissioner
John A. Tuma	Commissioner

PETITION FOR INVESTIGATION AND COMPLAINT OF HONOR THE EARTH

October 27, 2020

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ATTACHMENTS

INTRODUCTION

The primary purpose of this document is to submit a formal complaint to the Public Utilities Commission ("Commission") related to Enbridge Energy, Limited Partnership's and Enbridge Inc.'s (together "Enbridge") plan to increase the capacities of its Lines 4 and 67 by 10 percent or more, which triggers the recertification requirement in Minn. R. 7853.0800, subp. 2. In addition, Honor the Earth believes that this latest capacity addition should be considered in light of a series of completed capacity additions to Enbridge's Mainline System that have increased its overall capacity through more efficient use and upgrades to Enbridge's existing pipelines through Minnesota.

In the first quarter of 2020, before the pandemic impacted oil demand, U.S. federal and Canadian crude oil shipment data shows that in the first quarter of 2020 Enbridge successfully operated its Mainline System at a flow rate of over 2.8 million barrels per day ("bpd") on a sustained basis. This flow is approximately 400,000 bpd more crude oil than the maximum effective Mainline System capacity claimed by Enbridge during the L3RP evidentiary hearings of 2.4 million bpd. It is also more oil than the net increase in capacity that would be provided by the Line 3 Replacement Project ("L3RP") of 370,000 bpd, should it be constructed. The evidence presented herein shows that:

- Enbridge started its effort to add capacity to the Mainline System in 2016, before the L3RP evidentiary hearing;
- Enbridge was able to transport 2.6 million bpd in November 2017, at the time of the evidentiary hearing, approximately 200,000 bpd more oil than its experts claimed was possible;

- Enbridge continued its capacity addition efforts during the remainder of the L3RP hearing process; and
- Enbridge is continuing to this day to add capacity through upgrades and efficiency improvements.

With regard to its ongoing capacity addition efforts, Enbridge seeks to further increase Mainline System capacity through its imminent capacity additions to Lines 4 and 67. In August 2020, the Wisconsin Department of Natural Resources issued a public notice of an air pollution permit application stating that Enbridge intends to increase the flow of crude oil through Lines 4 and 67 by a total of 178,400 bpd through efficiency-based measures. Once these capacity additions come online, the Mainline System would be able to transport approximately 600,000 bpd, a 25 percent capacity increase relative to the 2.4 million bpd cap claimed by Enbridge in the L3RP evidentiary hearing.

Yet to Honor the Earth's knowledge, Enbridge has not reported these completed and planned capacity increases to the Commission. Given that all of the quantitative need and apportionment data submitted by Enbridge in the L3RP docket (Docket No. PL9/CN-14-916) capped future Mainline System capacity at 2.4 million bpd through 2035, the fact that Enbridge now has the undeniable ability to ship more than 2.8 million bpd, and will shortly be able to ship approximately 3 million bpd, casts significant doubt on the efficacy of Enbridge's forecasts. Since the Commission in Docket PL9/CN-14-916 did not consider the need for pipeline capacity beyond the 370,000 bpd of net capacity that would be provided by the L3RP, Enbridge through its efficiency-based capacity additions has apparently already met the commercial need for which the Commission approved the L3RP, and it will soon create additional capacity that will significantly exceed this need. The remarkable amount of additional capacity created by

Enbridge through efficiency improvements, optimization, and upgrades to existing pipelines has dramatically impacted the need for construction of a new pipeline.

Therefore, Honor the Earth respectfully requests that the Commission open an investigation under Minn. Stat. § 216B.14 into Enbridge's upgrades and efficiency-based capacity additions to its Mainline System through Minnesota from 2016 to present, as well as its planned capacity additions, including but not limited to more efficient use of Lines 4 and 67 and reversal of Line 13. The Commission should investigate these changes to confirm that Enbridge has complied with Minn. R. 7853.0800 and so that the Commission is aware of and fully understands the benefits and possible limitation and risks of Enbridge's capacity additions.

With regard to the proposed capacity additions to Lines 4 and 67, Honor the Earth respectfully submits this document as a Formal Complaint pursuant to Minn. Stat. § 216.13 and Minn. R. 7829.1700.[1] Honor the Earth asserts that Enbridge has or will increase the design capacities of its pipelines 4 and 67 by ten percent or more within Minnesota thereby substantially increasing the physical amount of oil that it will be able to transport through Minnesota. Accordingly, Enbridge is required by Minn. R. 7853.0800, subp. 2.A, to seek recertification for these pipelines. As relief, Honor the Earth requests that the Commission order Enbridge to submit a recertification application for its planned capacity additions to Lines 4 and 67.

[1] While Minnesota statutes do not expressly name pipeline owners and operators as being subject to complaint, they are nonetheless "carriers," within the meaning of Minn. Stat. § 216.13, and therefore subject to complaints. *See also* Minn. Stat. § 117.48 (granting the power of eminent domain to businesses transporting petroleum as "common carriers"). Moreover, Section 5.3 of the Commission's January 18, 2019, *Order Clarifying Prior Order, Excluding Filing, and Denying Reconsideration* established a complaint procedure for the Line 3 Replacement Project in Docket No. PL-9/PPL-15-137, thereby confirming that the Commission has jurisdiction to hear complaints related to crude oil pipeline matters within its jurisdiction.

PARTIES

Complainant/Petitioner:	Honor the Earth 607 Main Avenue Callaway, MN 56521
Complainant/Petitioner Rep:	Winona LaDuke Honor the Earth 607 Main Avenue Callaway, MN 56521
Complainant/Petitioner Counsel:	Paul Blackburn Staff Attorney Honor the Earth 607 Main Avenue Callaway, MN 56521
Respondent:	Enbridge Energy, Limited Partnership Enbridge Inc. 26 East Superior Street Duluth, MN 55802
Respondent's Counsel:	Christina K. Brusven FREDRIKSON & BYRON, P.A. 200 South Sixth Street, Suite 4000 Minneapolis, Minnesota 55402-1425

JURISDICTION

The Commission has jurisdiction to hear this matter, make findings of fact, and order appropriate relief under Minn. Stat. § 216.13, Minn. Stat. § 216B.14, Minn. R. 7829.1700, and Minn. R. 7853.0800, subp. 2.

STATEMENT OF LAW

Honor the Earth alleges that Enbridge violated Minn. R. 7853.0800, and particularly subp. 2.A. This rule states in full:

7853.0800 CERTIFICATE OF NEED MODIFICATIONS.

> **Subpart 1. Authority of commission.** Issuance of a certificate may be made contingent upon modifications required by the commission.
>
> **Subp. 2. Changes not requiring recertification.** The following changes in a facility previously certified by the commission shall not require recertification:
> A. capacity additions or subtractions of less than ten percent of the capacity approved by the commission;
> B. pipeline length additions or subtractions of less than ten percent of the length approved by the commission; and
> C. changes of less than two years in the in-service date.
>
> **Subp. 3. Procedure in case of other changes.** If an applicant determines that a change greater or other than those specified in subpart 2 is necessary or desirable, it shall inform the commission of the desired change, accompanied by a written statement detailing the reasons for the proposed change. The commission shall evaluate these reasons and within 45 days of receipt of the application notify the applicant whether the proposed change is acceptable without recertification.

The clear intent of this rule is to ensure that the Commission is aware of and "recertifies" significant changes to pipelines for which the Commission has previously issued certificates of need, where such changes increase capacity or length by 10 percent or more but less than the 20 percent that under Minn. R. 7853.0030.D would trigger a full certificate of need hearing. While Minn. R. ch. 7853 is silent on the procedure required to comply with Minn. R. 7853.0800, its plain language nonetheless requires that the Commission take action to recertify capacity additions of 10 percent or more.

STATEMENT OF FACT

This Complaint and Petition presents evidence regarding:

- the definitions of pipeline capacity used by Enbridge;
- actual shipments of crude oil on the Mainline System from January 2014 to June 2020;

- Enbridge's claimed Mainline System maximum effective capacity in Docket PL/CN-14-916;
- Enbridge's "design, "average annual," "effective," and "available" capacities from 2014 to 2020;
- Enbridge's capacity additions to the Mainline System between 2016 and 2020;
- Enbridge's plan to increase the capacities of Lines 4 and 67 by more than 10 percent each, for a total of 178,400 bpd of additional capacity; and
- Enbridge's continuing plan to reverse Line 13, which would add approximately another 150,000 bpd of new import capacity, and likely completed 50,000 bpd capacity additions to its Express Pipeline.

I. Definitions of Pipeline Capacity

Since this petition and complaint relate to evidence of Enbridge's past claims regarding the capacity of its pipelines, its past capacity additions, and its current plan to increase the capacities of Lines 4 and 67, it is necessary to understand Enbridge's three pipeline capacity definitions, as well as the definition of "available" capacity used by Enbridge in its reports to the Canadian Energy Regulator ("CER"), the Canadian government agency that regulates crude oil pipelines in Canada..

"Design" Capacity: Enbridge describes this capacity definition as pipeline capacity "assuming ideal operating conditions," meaning the maximum volume of oil that a pipeline is engineered to transport in a day assuming no disruptions to operation.[2] Since this capacity

[2] Enbridge, Certificate of Need Application for the L3RP (Apr. 24, 2015) ("CN Application") at 8-3, available at: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={B3F4436C-C994-47DD-BCF0-49CF6F44E17E}&documentTitle=20154-109653-03

number is based on the engineering of the pipes, pumps, and other equipment that make up a pipeline, it is an accurate measurement of a pipeline's maximum physical capacity. For example, the new pipeline that would be built by the L3RP has a "design" capacity of 844,000 bpd.[3]

"Average Annual" or "Nameplate" Capacity: Enbridge describes this capacity definition as "the average sustainable pipeline throughput over a year," meaning the volume of oil that a pipeline would be expected to transport on average per day taking into account operational inefficiencies and planned (*e.g.*, maintenance) and unplanned disruptions (*e.g.*, equipment failures, power outages).[4] This measurement is an estimate of the maximum expected commercial capacity of a pipeline expressed on a per day basis. It is the capacity definition most commonly used in public descriptions of pipelines, and it is the capacity definition used by the Commission when approving pipelines. Enbridge estimates the "average annual" capacity by calculating it to be 90 percent of the "design" capacity. Thus, for the L3RP, 90 percent of 844,000 bpd equals 760,000 bpd, which is the "average annual" or "nameplate" capacity of the new pipeline that would be built by the L3RP.[5]

"Effective" Capacity: During the L3RP evidentiary hearing Enbridge introduced an additional definition of pipeline capacity in the Direct and Rebuttal Testimony of John Glanzer, Enbridge's Director of Infrastructure Planning & Lifecycle Effectiveness, that he called "effective" capacity, which relates to the overall capacity of Enbridge's Mainline System.[6] Mr. Glanzer explained that "the effective capacity of the Enbridge Mainline system . . . is empirically based on historical operations data averaged over three years from 2014 to 2016 and accounts for

[3] *Id*.
[4] *Id*.
[5] *Id*.
[6] Glanzer Direct Testimony at 13-14, Figures 1 and 2; Glanzer Rebuttal Testimony at 6.

operating impediments such as terminal conflicts, supply interruptions, refinery slowdowns, etc."[7] Mr. Glanzer calculated that the "effective" capacity of the Mainline System is 92 percent of its total "average annual" capacity.[8] He testified that the Mainline System as it existed in 2017 included 1,468,000 bpd of "effective" heavy oil capacity and 949,000 bpd of "effective" light oil capacity, for a total Mainline System "effective" capacity of 2,417,000 bpd.[9] He also testified that if the L3RP were built, then the "effective" capacity of the Mainline System would increase to 2,757,000 bpd,[10] meaning that the L3RP would provide 340,000 bpd of additional "effective" capacity to the Mainline System (340,000 bpd is 92 percent of 370,000 bpd, which in turn is the net increase in "average annual" capacity that would be provided by the L3RP).

"Available" Capacity: The CER defines "available" capacity as:

> Available capacity is what a pipeline can actually flow. The available capacity of a pipeline typically differs from its nameplate capacity. This can be for various reasons, such as the type of crude oil being transported, unplanned outages, maintenance, downstream constraints, or pressure restrictions. Pipeline operators calculate how much volume of product the pipeline can actually carry on any given day. [Footnote omitted.][11]

Enbridge reports the Mainline System's monthly "available" capacity to the CER. This definition is similar to the definition of "effective" capacity used by Mr. Glanzer, in that both definitions are based on actual historical flows and they take account of a variety of operational constraints. This being said, since Enbridge has not released detailed descriptions of how it calculates either

[7] Glanzer Rebuttal Testimony at 6.
[8] *Id*.
[9] Glanzer Rebuttal Testimony, Schedule 3, at 3 (table entitled "Enbridge Mainline Throughput and Apportionment — Gretna to Clearbrook"); at 5 (Table 3.5.2-5).
[10] Glanzer Rebuttal Testimony, Schedule 3, at 3 (table entitled "Enbridge Mainline Throughput and Apportionment — Gretna to Clearbrook"); at 6 (Table 3.5.2-6).
[11] Definition available at: https://www.cer-rec.gc.ca/en/data-analysis/energy-commodities/crude-oil-petroleum-products/report/2018-western-canadian-crude/index.html

its "effective" or "available" capacities, it is not possible for Honor the Earth to know if and how these definitions might differ.

When comparing capacities of pipelines over time, it is important to know which definition is being used with regard to each particular capacity number discussed. Unfortunately, Enbridge's public statements are not always clear about which type of capacity number it is using. This petition and complaint attempt to identify each capacity number presented herein by type, but given Enbridge's lack of clarity, some assumptions need be made.

II. All of Enbridge's Need and Apportionment Quantitative Evidence in the L3RP Evidentiary Hearing Assumed that the Maximum Capacity of the Mainline System would be 2,417,000 bpd, Such That Unless the L3RP Was Constructed Throughput on the Mainline System Would Be Capped at This Level Through 2035

When analyzing capacity additions to a pipeline system it is necessary to establish a baseline capacity for the system at specific points within it. In this regard, Mr. Glanzer calculated Enbridge's L3RP apportionment forecasts based on a Mainline System "effective" capacity for imports into the U.S. ("ex-Gretna") of 1,468,000 bpd of heavy oil capacity and 949,000 bpd of light oil capacity, for a total Mainline System "effective" capacity of 2,417,000 bpd.[12] All of the apportionment forecasts and calculations that he presented, and that the Commission relied upon, assumed that Enbridge could not transport more than these quantities of crude oil unless the L3RP was constructed.[13] Specifically, Mr. Glanzer's forecast of apportionment without the L3RP showed no increase in Mainline System capacity from 2019 to

[12] Glanzer Direct Testimony at 13 and Schedule 2 at 1 (Table 3.5.2-3); Glanzer Rebuttal Testimony, Schedule 3 page 3 of 26 (table entitled "Enbridge Mainline Throughput and Apportionment — Gretna to Clearbrook", and particularly the lines under "Mainline Capacity Pre-Project"); Schedule 3 page 5 (Table 2.5.2-5).

[13] *Id*.; Findings of Fact, Conclusions of Law, and Recommendation in Docket PL-9/CN-14-916 ("ALJ Report") at 182-83 (Figures 1 and 2) (citing Glanzer Direct Testimony at 13).

2035.[14] Likewise, Neil Earnest, Enbridge's expert on the commercial need for the L3RP, used the same "effective" heavy and light crude oil capacity figures as the baseline for his analysis of the need for the L3RP, on which the Commission also relied.[15] Since Enbridge's apportionment and need experts both used the same "effective" capacity figures as the baseline when determining the need for additional crude oil transportation capacity, the appropriate baseline to use when determining if Enbridge has increased capacity subsequent to the L3RP evidentiary hearing and thereby met the need found by the Commission is a system capacity of 2,417,000 bpd.

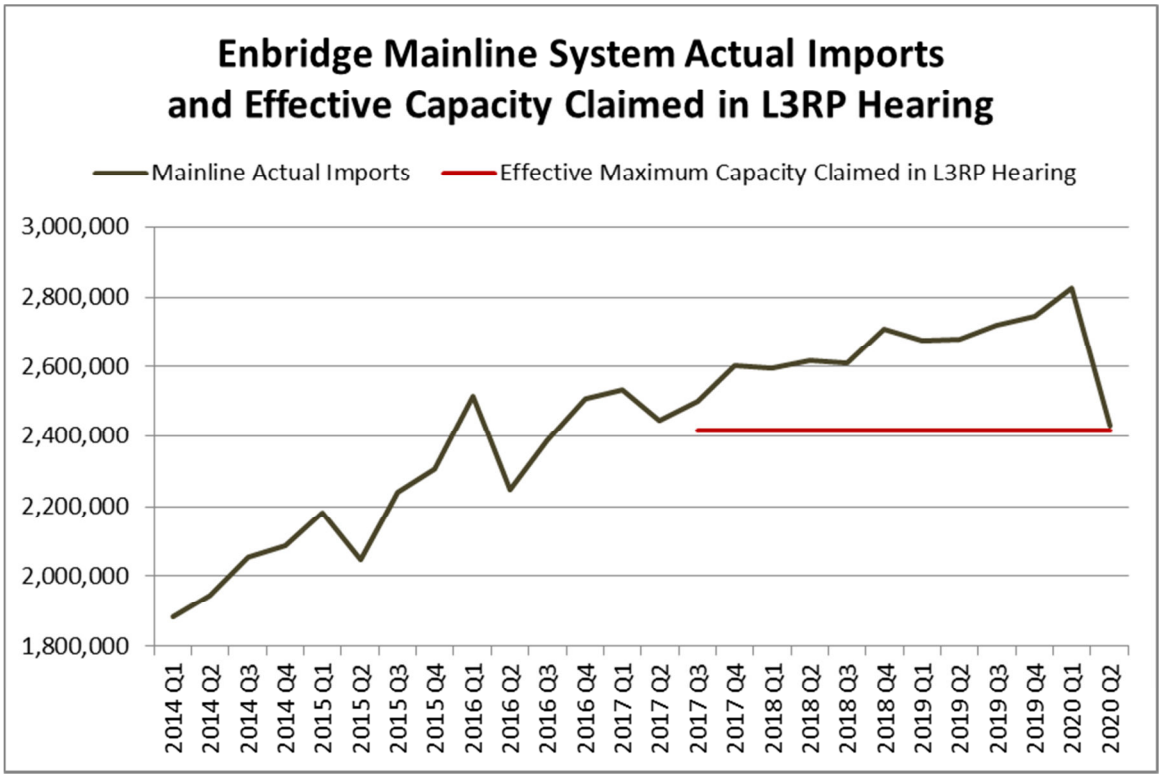
III. Data From the Federal Energy Regulatory Commission Shows That In the First Quarter of 2020 Enbridge Transported 400,000 bpd More Oil on Existing Pipelines Than It Claimed Was Possible During the Evidentiary Hearing

Although there are a number of ways of defining pipeline capacity, it is ultimately proven (as opposed to being estimated) by the maximum volume of crude oil that can actually be transported on a pipeline over time. In this regard, Enbridge reports actual shipments on the Mainline System to the Federal Energy Regulatory Commission ("FERC") on a quarterly basis in its Form 6 and 6Q filings.[16] It typically submits this data to FERC three to four months after the end of each quarter.[17] Since the FERC data is Enbridge's actual crude oil shipments and not

[14] Glanzer Direct Testimony, Schedule 2 at 1 (Table 3.5.2-3 Glanzer Rebuttal Testimony, Schedule 3 page 3 of 26 (table entitled "Enbridge Mainline Throughput and Apportionment — Gretna to Clearbrook", and particularly the lines under "Mainline Capacity Pre-Project"); Schedule 3 page 5 (Table 2.5.2-5).
[15] Direct Testimony of Neil Earnest, Schedule 2 at 63 ("Thus, prior to the L3R Program, the effective light and heavy crude oil capacities of the Gretna to Clearbrook segment are 949 and 1,468 kb/d, respectively . . ."); *see also* Direct Testimony of Neil Earnest, Schedule 2 at 98, 100, 102, 104.
[16] Enbridge's FERC Form 6 and 6Q filings can be downloaded from the FERC eLibrary at: https://elibrary.ferc.gov/eLibrary/search. This data is provided by Enbridge to FERC under penalty of perjury.
[17] For example, Enbridge filed its 2017 Q4 FERC Form 6 on April 18, 2018, more than five months after the end of the evidentiary hearing.

estimated capacities, it takes into account all real-world inefficiencies and disruptions experienced during that quarter.

The chart below shows FERC data for Enbridge's actual crude oil shipments on its Mainline System together with the "effective" Mainline System capacity cap claimed by Enbridge during the evidentiary hearing (Attachment A). The data in Enbridge's FERC Form 6 and 6Q filings prove that in 2020 Q1 the Mainline System transported a record 2,826,172 bpd on average in that quarter from Canada into Minnesota. It also shows that during and since the L3RP evidentiary hearing Enbridge has consistently transported more oil than the "effective" capacity it claimed during the hearing. Therefore, it appears that Enbridge either implemented capacity additions starting before the evidentiary hearing and/or underestimated the "effective" capacity of the Mainline System in the L3RP evidentiary hearing. While use of historical "effective" capacities might seem reasonable, it is unlikely that Enbridge would lose its gained efficiencies and it should also have accounted for any anticipated planned efficiency improvements.



Quarter	Total Barrels Received at International Border in Quarter	Average Barrels Per Day Received at International Border in Quarter
2015 Q1	199,142,151	2,182,380
2015 Q2	386,105,801	2,048,917
2015 Q3	590,760,113	2,242,787
2015 Q4	801,118,018	2,305,292
2016 Q1	229,437,275	2,514,381
2016 Q2	434,752,610	2,250,031
2016 Q3	652,522,702	2,386,522
2016 Q4	881,369,313	2,507,908
2017 Q1	231,335,352	2,535,182
2017 Q2	454,680,492	2,447,618
2017 Q3	682,909,360	2,501,138
2017 Q4	920,366,015	2,602,265
2018 Q1	237,027,845	2,597,565
2018 Q2	475,797,180	2,616,650
2018 Q3	714,109,228	2,611,639
2018 Q4	961,170,152	2,707,517

2019 Q1	244,048,331	2,674,502
2019 Q2	488,433,699	2,678,196
2019 Q3	736,482,861	2,718,347
2019 Q4	986,922,286	2,744,542
2020 Q1	257,888,193	2,826,172
2020 Q2	479,649,365	2,430,259

The FERC data shows:

- Enbridge steadily expanded actual shipments on the Mainline System by approximately 400,000 bpd beyond the effective capacity limit claimed in Mr. Glanzer's apportionment testimony and Mr. Earnest's commercial need testimony;[18]
- at the time of the evidentiary hearing in November 2017, Enbridge was already shipping an average of 2,602,265 bpd in the quarter, approximately 185,000 bpd more crude oil than the claimed "effective" capacity cap;[19]
- Enbridge currently has the capacity to import more crude oil on the Mainline System (2,826,172 bpd) than Enbridge claimed in the L3RP evidentiary hearing would be available on the Mainline System if the L3RP was constructed (2,757,000 bpd[20]); and
- the global oil crisis triggered by the pandemic reduced throughput of crude oil on the Mainline System from a peak of 2,826,172 bpd in 2020 Q1 to 2,430,259 bpd in 2020 Q2, leaving the Mainline System with approximately 400,000 bpd of unutilized capacity relative to its maximum shipments.

[18] Glanzer Rebuttal Testimony at Schedule 3 at 3; Direct Testimony of Neil Earnest, Schedule 2 at 63, 98, 100, 102, 104.
[19] Since there is a three to four month delay in the FERC data and the overall trend above the claimed baseline could not be known in advance, it was not possible to challenge the claimed "effective" capacity using FERC data during the evidentiary hearing.
[20] Glanzer Rebuttal Testimony at Schedule 3 at 3; Direct Testimony of Neil Earnest, Schedule 2 at 63, 98, 100, 102, 104.

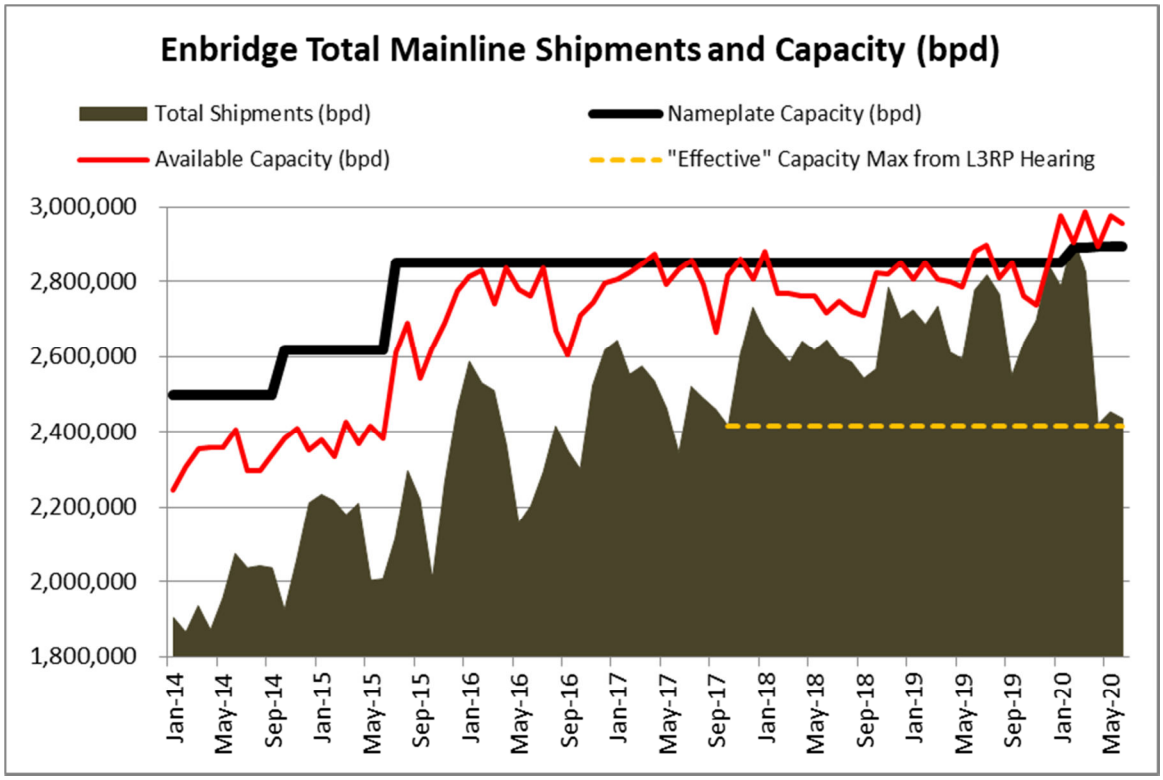
Although Mainline System throughput in 2020 Q3 is not public knowledge, given continued low oil prices and suppressed consumer demand for petroleum products resulting from the pandemic, it is likely that utilization of the Mainline System continues to be well below its maximum historical flow.

IV. Data From the Canadian Energy Regulator Shows That Enbridge Shipped 400,000 bpd More Oil in the First Quarter of 2020 Than Enbridge Claimed Was Possible in the L3RP Evidentiary Hearing, Had Far More Capacity "Available" Than It Claimed in the L3RP Evidentiary Hearing, and Has Continued to Increase the "Available" Capacity of the Mainline System through 2020

The CER provides more detailed data showing the Mainline System's "nameplate" and "available" capacities and actual shipments on a monthly basis (Attachment B).[21] This data is submitted quarterly to the CER by oil pipeline companies.[22] The following charts of this data show actual crude oil flows "ex-Gretna" (across the border into the U.S.) on a monthly and annual basis relative to the Mainline System's "nameplate" and "available" capacities, and to the "effective" capacity claimed by Enbridge during the L3RP evidentiary hearing.

[21] The CER data including an interactive charting tool is vailable at https://www.cer-rec.gc.ca/en/data-analysis/energy-commodities/crude-oil-petroleum-products/pipeline-profiles/pipeline-profiles-enbridge-mainline.html.

[22] CER *Filing Manual – Guide BB – Financial Surveillance Reports (Toll Information Regulations)*, available at: https://www.cer-rec.gc.ca/en/applications-hearings/submit-applications-documents/filing-manuals/filing-manual/filing-manual-guide-bb-financial-surveillance-reports-toll-information-regulations.html#sbb_2


Enbridge Total Mainline Shipments and Capacity (bpd)
Total Shipments (bpd)
Nameplate Capacity (bpd)
Available Capacity (bpd)
"Effective" Capacity Max from L3RP Hearing
3,000,000
2,800,000
2,600,000
2,400,000
2,200,000
2,000,000
1,800,000
Jan-14
May-14
Sep-14
Jan-15
May-15
Sep-15
Jan-16
May-16
Sep-16
Jan-17
May-17
Sep-17
Jan-18
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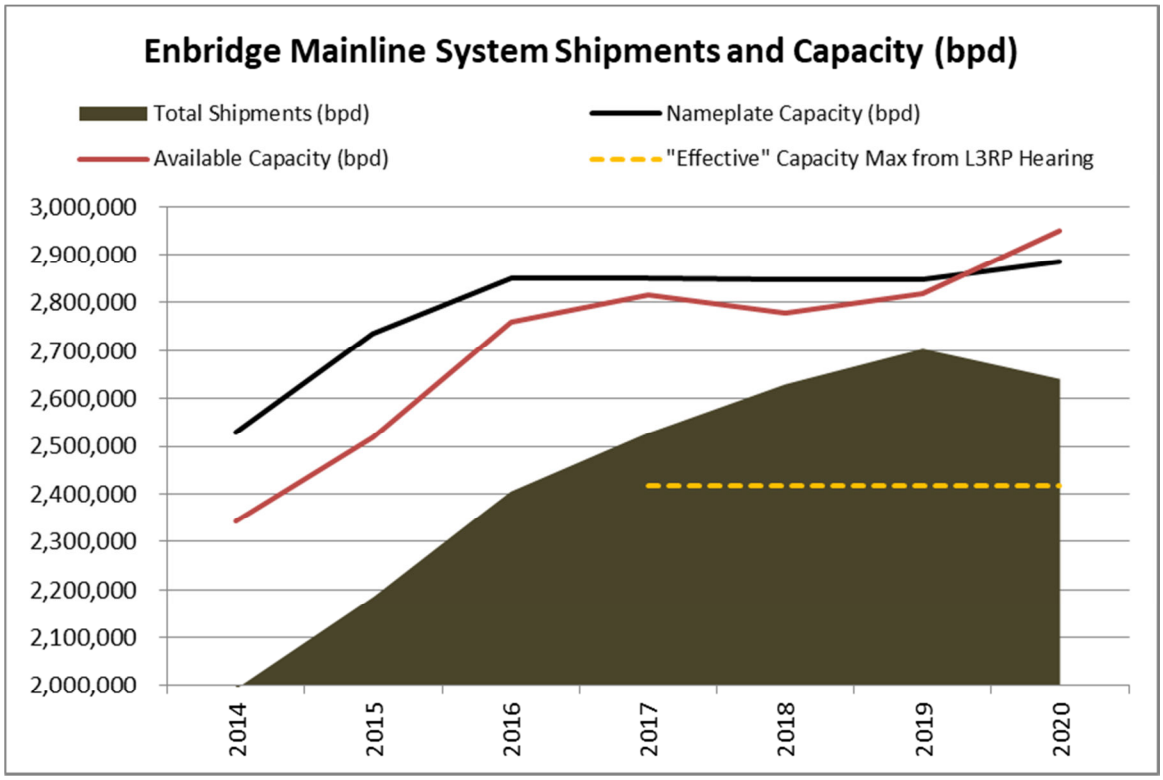
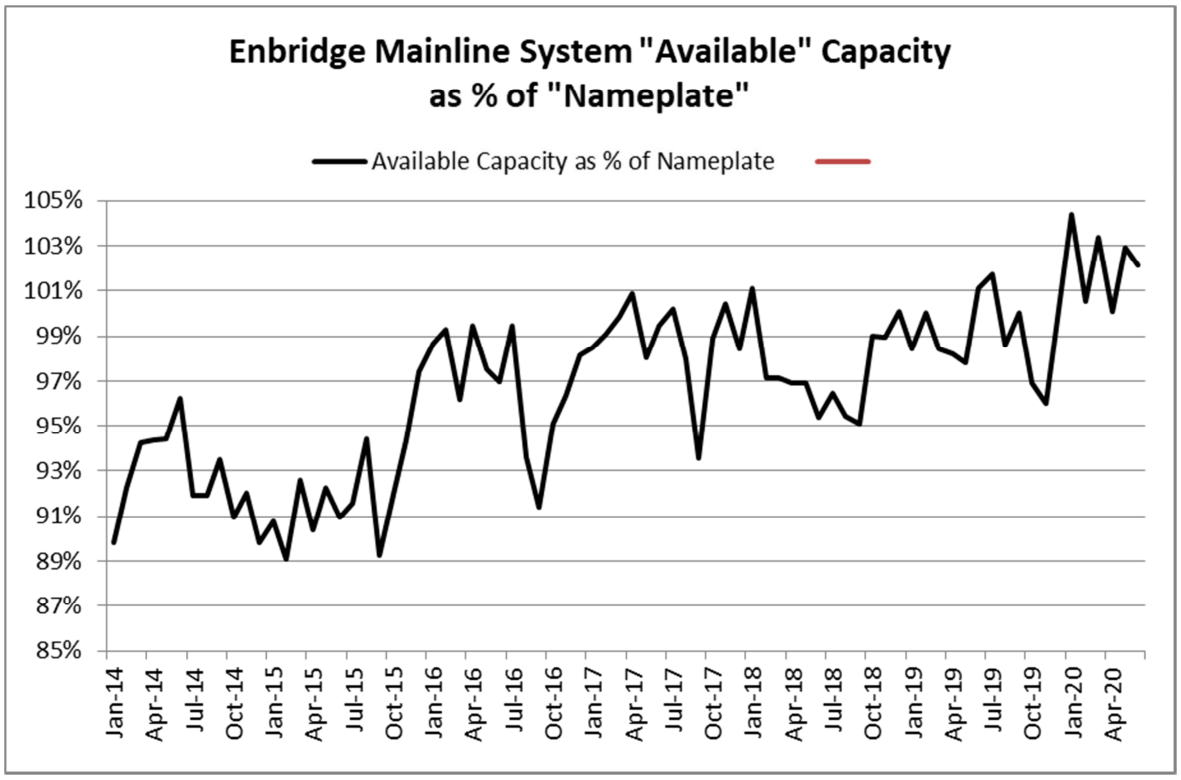
Jan-20
May-20


Enbridge Mainline System Shipments and Capacity (bpd)
Total Shipments (bpd)
Nameplate Capacity (bpd)
Available Capacity (bpd)
"Effective" Capacity Max from L3RP Hearing
3,000,000
2,900,000
2,800,000
2,700,000
2,600,000
2,500,000
2,400,000
2,300,000
2,200,000
2,100,000
2,000,000
2014
2015
2016
2017
2018
2019
2020

The following chart shows the "available" capacity of the Mainline System expressed as a percent of its "nameplate" capacity, and is a measure of how efficiently Enbridge is using existing capacity.



The CER data shows:

- Flow through the Enbridge Mainline System is not steady but rather is cyclical, with peaks typically occurring in the winter and troughs in the autumn, probably due to the timing of annual refinery maintenance periods, though this pattern sometimes varies. Annual variability is typically in the 200,000 to 300,000 bpd range. The peak monthly actual flow was 2,919,773 bpd in February 2020. The peak annual actual flow was 2,703,389 bpd in 2019. Both of these flows are substantially higher than the "effective" capacity claimed by Enbridge in the L3RP evidentiary hearing.

- Enbridge began to reduce the difference between "nameplate" and "available" capacity beginning in late 2015 to early 2016. "Available" capacity remained close to "nameplate" capacity until 2020, when "available" capacity exceeded "nameplate" capacity. While "available" capacity averaged about 92 percent of "nameplate" capacity before 2016, starting in 2016 the percentage "available" increased substantially to about 98 percent from 2016 to 2019, and it averaged 102 percent in the first half of 2020. Thus, it appears that Enbridge has been able to increase throughput on the Mainline System well beyond the 92 percent "effective" capacity cap claimed in the L3RP evidentiary hearing.
- Total shipments "ex-Gretna" (into the U.S.) exceeded Enbridge's claimed "effective" capacity cap for all months from November 2017 until the pandemic dramatically reduced shipments in April 2020. Actual average annual shipments exceeded Enbridge's claimed "effective" capacity cap for the years 2017 through 2020.
- Enbridge recently increased the Mainline System's "available" capacity to just under 3 million bpd and also increased "available" capacity so that it exceeds "nameplate" capacity by over 65,000 bpd. How Enbridge accomplished this is unknown to Honor the Earth.
- Despite Enbridge's claims that apportionment indicates a lack of excess capacity on the Mainline System, relative to reported "available" capacity, Enbridge had substantial unused capacity for the years 2015 through 2018. In 2019 and early 2020, actual shipments came close to Mainline System "available" capacity, but at no time have shipments equaled "available" capacity.

- Total Mainline System shipments dropped to 2,436,000 bpd in June 2020, leaving approximately 500,000 bpd of unused capacity, relative to "available" capacity.

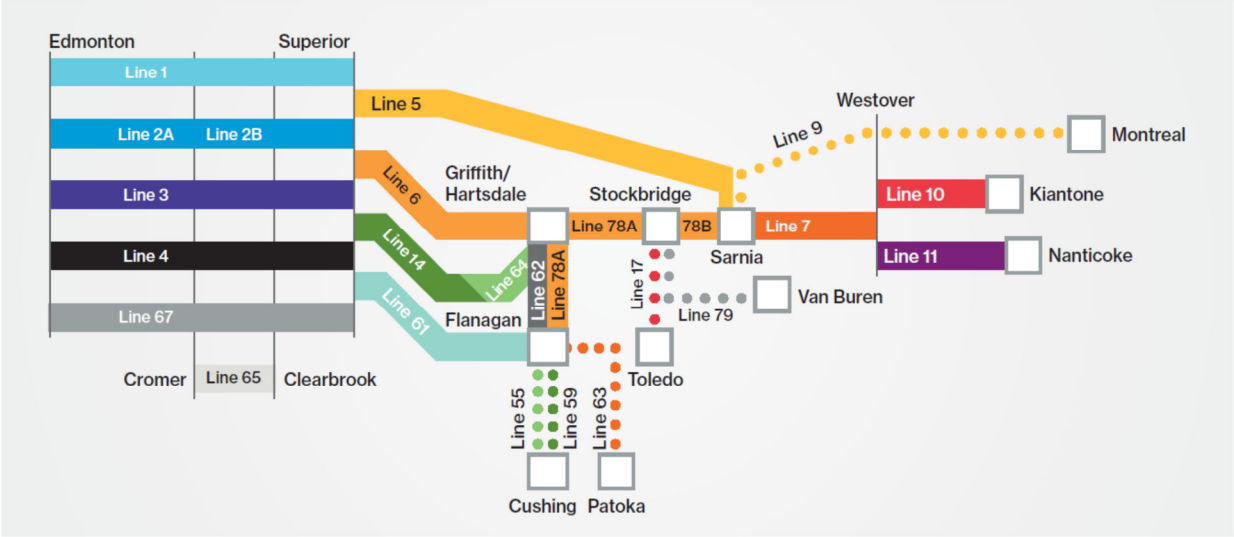
The CER data indicates that Enbridge's "effective" capacity figures provided to the PUC during the evidentiary hearing were far less than Enbridge's actual shipments of crude oil at that time and going forward. While pre-2016 "effective" capacity was lower, by the time of the evidentiary hearing, Enbridge had almost two years of data showing that "available" capacity averaged 98 percent of "nameplate" capacity. Honor the Earth does not know why Enbridge's "available" capacity in 2016 and 2017 differed substantially from its claimed "effective" capacity during this time. In any case, it is clear that Enbridge learned how to operate the Mainline System on average much closer to its "average annual" or "nameplate" capacity than the 92 percent "effective" capacity claimed by Enbridge during the evidentiary hearing. But rather than update its testimony to show that it had in fact increased throughput on existing pipelines by improving efficiency, and likely could further improve capacity, Enbridge continued to base its need and apportionment analyses on its outdated "effective" capacity cap.

V. Enbridge Mainline System Capacity and Capacity Additions from 2016 to 2018

Each year in January, Enbridge publishes a "System Configuration" document that lists the "average annual" capacity of each of the pipelines that comprise the Mainline System, and each such document also includes an overall schematic for the Mainline and its interconnections with other downstream pipelines that Enbridge owns. Attachment C contains the System Configuration documents for the years 2016 to 2020.[23] The pipeline system schematic (below) is

[23] The 2020 System Configuration document may be downloaded from: https://www.enbridge.com/~/media/Enb/Documents/maps/2020%20Refiners%20Book%20-%20Pipeline%20System%20Configuration.pdf?la=en.

contained in all of the System Configuration documents from 2016 through 2018, because the overall structure of the Mainline System did not change during this time.



As can be seen, Lines 1, 2, 3, 4, and 67 pass through Enbridge's Clearbrook Terminal to their final terminus at the Superior Terminal. In contrast, Line 65 terminates at the Clearbrook Terminal. Enbridge's System Configuration documents also show the "average annual" or "nameplate" capacities of the Mainline System pipelines did not change from 2016 through 2019. These "average annual" capacities at the time of the L3RP evidentiary hearing are shown below, together with calculated "design" and "effective" capacities for each pipeline at this time.

2016 to 2018 Mainline System Pipeline Capacity				
Pipeline Name	**Terminus**	**Design Capacity (bpd)[24]**	**Average Annual Capacity @ 90% of Design Capacity (bpd)[25]**	**Effective Capacity @ 92% of Average Annual Capacity (bpd)[26]**
Line 1	Superior	263,000	237,000	218,000
Lines2A/2B	Superior	491,000	442,000	407,000
Line 3	Superior	433,000	390,000	359,000

[24] Calculated by dividing "average annual" capacities by 0.9.
[25] From Attachment C.
[26] Glanzer Rebuttal Testimony at 4-6 (calculated by multiplying "average annual" capacities by 0.92).

Line 4	Superior	884,000	796,000	732,000
Line 65	Clearbrook	207,000	186,000	171,000
Line 67	Superior	889,000	800,000	736,000
Total Import Capacity at Border		3,167,000	2,851,000	2,623,000
Total into Superior Terminal		**2,960,000**	**2,665,000**	**2,452,000**
"Effective" capacity claimed by Enbridge, including adjustment to "effective" capacity possibly to account for effect of internal Canadian refined product shipment conflicts (-35,000)[27]		2,919,082	2,627,174	2,417,000

Thus, the calculated "effective" capacity of the Mainline System is 2,452,000 bpd. Enbridge claimed during the L3RP that the "effective" capacity of the Mainline System was 2,417,000 barrels. The 35,000 bpd difference may be based on bottlenecks in Canada related to internal shipment of refined products on the Mainline System. Enbridge also claimed that the L3RP would increase the "effective" capacity of the Mainline System to 2,757,000 bpd.[28]

In an August 1, 2019, Bloomberg article, Jesse Semko, a Senior Advisor for Corporate Communications for Enbridge, told reporter Robert Tuttle that Enbridge had optimized its pipeline system to create about 220,000 barrels per day of "new" capacity over the past "couple of years." Attachment D. In its Amended Response to Honor the Earth Information Request No. 15, dated January 13, 2020 (Attachment E), Enbridge confirmed that:

> [t]he 220,000bpd figure reported by Mr. Tuttle is accurate. It references the amount of capacity recovery and optimizations

[27] The "effective" import capacity figure provided by Mr. Glanzer (Glanzer Rebuttal Testimony at Schedule 3, page 3 of 26) was a combined heavy and light crude oil capacity of 2,417,000, which figure reduces total import capacity by 35,000 bpd possibly due to internal refined product shipments in Canada that slightly reduce maximum imports. Glanzer Rebuttal Testimony at 4-6.
[28] Glanzer Rebuttal Testimony at Schedule 3 at 3.

> achieved 2016 through 2018. Enbridge has optimized its operation by safely removing bottlenecks allowing the increased utilization of the existing system pipeline capacity.

Enbridge explained this increase in Mainline System capacity as follows:

> The 220,000bpd is comprised of capacity recoveries for Lines 2B, 65 and 4 and from Mainline System optimizations starting from 2016. System optimization includes activities such as modifying scheduling practices, optimizing maintenance work to minimize down time and lower response times to technical challenges. These are ongoing activities and do not have specific in-service dates or effective capacity additions but are anticipated to increase general utilization of the system capacity.
>
> These are not increases to current design capacity, but increases in utilization of the existing pipeline network. The 220,000bpd increase is already accounted for in the update utilization factor provided in Enbridge's Response to HTE IR No. Request 14.

Since this 220,000 bpd capacity addition is described by Enbridge as being accomplished by 2018, it appears that the capacity increases for Lines 4 and 67 described in the PSD Application are in addition to this capacity addition.

VI. Enbridge Mainline System Capacity and Capacity Additions in 2019 and 2020

In response to Honor the Earth Information Request 16 (Attachment E), Enbridge described its 2019 and 2020 capacity recovery efforts to include the following projects that produced a further 150,000 bpd of capacity additions in 2019 and 2020:

- 2019 Window management: 35,000bpd
- Line 3R in Canada: 40,000bpd
- Line 4 Capacity recovery: 25,000bpd
- 2020 Window management: 50,000bpd

These additions total 150,000 bpd. The response further described these capacity additions as follows:

b. The safe removal of the network bottlenecks to increase the utilization of the Mainline System includes:

- Replacing the first capacity constraint for Line 3 by putting Line 3R into service in Canada. Line 3R Canada ties in to existing Line 3 at the US border. L3US will continue to operate consistent with all regulatory requirements including Maximum Allowable Operating Pressure. ISD Q4 2019.
- Enbridge was able to increase Line 4's throughput by transporting heavier molecules, which previously travelled on Line 4 for delivery to Regina, onto lines transporting lighter molecules. This re-allocation eliminated windows at Regina which created a "hole" in the Line 4 batch schedule.
- Optimization of Line 4 window management by moving heavier molecules that previously travelled on Line 4 onto lighter lines (no need for changes to the physical scope). ISD Q4 2019.
- Line 4 capacity recovery by adding new DRA skids, trimming pump impellers and modifying motors at multiple pump stations along Line 4 in Canada and the US. ISD Q4 2019.
- Optimization of Line 1 window management by using Line 3R capacity in Canada to re-inject volumes moving on L3R in Canada into Line 1 at Gretna (new piping and associated facilities are currently under construction at the Gretna Terminal. Expected ISD Q1 2020.

Enbridge's 2020 System Configuration document shows Line 3's capacity as 430,000 bpd,[29] an addition of 40,000 bpd or 10.2 percent more capacity, in order to reflect the change in Line 3's "average annual" capacity. Attachment C.

Taken together, the 2016 to 2020 capacity additions completed by Enbridge total 370,000 bpd (220,000 bpd plus 150,000 bpd), coincidentally the same capacity addition as would be provided by the L3RP.

[29] Attachment C.

In response to Honor the Earth Information Request 14.f, dated January 1, 2020, Enbridge stated that the "effective" capacity of the Mainline System as of the date of that request was 97 percent. Attachment E.

When Line 3's expansion is 40,000 bpd of additional "average annual" capacity is added to the Mainline System's overall capacity, and the "effective" capacity rate of 97 percent is taken into account, and intra-Canada constraints removed by the construction of new Line 3 there,[30] the system's capacities are estimated to be as follows.

2020 Mainline System Pipeline Capacity				
Pipeline Name	**Terminus**	**Design Capacity (bpd)[31]**	**Average Annual Capacity @ 90% of Design Capacity (bpd)[32]**	**Effective Capacity @ 97% of Average Annual Capacity (bpd)[33]**
Line 1	Superior	263,000	237,000	230,000
Lines2A/2B	Superior	491,000	442,000	429,000
Line 3	Superior	478,000	430,000	417,000
Line 4	Superior	884,000	796,000	772,000
Line 65	Clearbrook	207,000	186,000	180,000
Line 67	Superior	889,000	800,000	776,000
Total Import Capacity at Border		3,212,000	2,891,000	2,804,000
Total into Superior Terminal		**3,005,000**	**2,705,000**	**2,624,000**

Thus, taking into account the existing Line 3 capacity addition, the maximum "design" capacity of the Mainline System to deliver crude oil to the Superior Terminal is estimated to be 3,005,000. It should also be noted that Enbridge's actual imports into the U.S., which are shown

[30] It is possible that construction of new Line 3 in Canada has eliminated the impact of internal Canadian refined product shipments on exports, because old Line 3 is likely continuing to operate in Canada.
[31] Calculated by dividing "average annual" capacities by 0.9.
[32] From Attachment C.
[33] Calculated by multiplying "average annual" capacities by 0.97, the "effective" capacity limit identified in Enbridge's response to Honor the Earth Information Request 14.f.

in the FERC and CER data, are respectively 2,826,172 bpd (quarterly) and 2,919,773 bpd (monthly), both of which are in excess of the estimated "effective" capacity of the Mainline System ex-Gretna (2,804,000 bpd), assuming that the current "effective" capacity is 97 percent of nameplate capacity.

VII. Enbridge's Plan to Increase the Design Capacities of Lines 4 and 67

On January 17, 2020, Enbridge submitted its *Prevention of Significant Deterioration Permit Application for the Superior Terminal Enhancements 2020 Project* ("PSD Application") to the Wisconsin Department of Natural Resources ("WIDNR"). (Attachment F).[34] The WIDNR docketed this Application on January 21, 2020, and provided public notice of it on August 3, 2020.[35] The PSD Application states that Enbridge plans to expand the capacities of Lines 4 and 67, and that these capacity additions require a corresponding physical modification of the large crude oil storage tanks located in Enbridge's Superior Terminal.[36] The PSD Application seeks permission to physically modify the Superior Terminal to allow an increase in input of crude oil from pipelines across Minnesota into the Superior Terminal from 3,035,000 bpd to 3,213,400 bpd, [37] an increase of 178,400 bpd.[38] Although the PSD Application does not state whether the

[34] Attachment F includes only Part 1, the narrative section, of the PSD Application. file:///C:/Users/BLACKC~1/AppData/Local/Temp/816010580-P17%20and%2020-XXX-011_Application_Part_I.pdf The other parts of the Application may be downloaded under the "Permits and Permit Applications" tab at: https://dnr.wi.gov/cias/am/amexternal/AM_PermitTracking2.aspx?id=3002436

[35] *Id*.

[36] PSD Application at 2-3.

[37] Enbridge does not specify whether these figures are the before and after design capacities or annual average capacities of the Mainline System pipelines that deliver crude oil to the Superior Terminal, but it is likely to be the combined design capacity of Lines 1, 2, 3, 4, and 67. It is unknown why the design capacity in the PSD Application is 30,000 bpd larger than indicated by Enbridge's 2020 System Configuration document (Attachment C).

[38] PSD Application at Section 1.3.1, p. 2. Downstream capacity constraints will limit output from the Superior Terminal, *id*., but such downstream constraints do not mean that Lines 4 and 67 could not be each operated at the greater capacities stated in the PSD Application, for example when other pipelines into the Superior Terminal suffer temporary capacity reductions.

figures 3,035,000 bpd and 3,213,400 bpd are "design," "average annual," or "effective" capacities, the fact that these numbers are greater than the calculated "design" capacity of the existing Mainline System (3,005,000 bpd) to deliver crude oil in the Superior Terminal indicates that the proposed capacity additions to Lines 4 and 67 are likely additions to their "design" capacities and as such increase capacity above these line's currently permitted[39] capacities.

The function of the tanks in the Superior Terminal is to receive oil from incoming pipelines, after which the tanks are emptied into one of Enbridge's four outgoing pipelines through Wisconsin (Lines 5, 6, 14/64, and 61). The tanks allow transfer of crude oil between

[39] The Commission originally permitted Line 4 in two segments, referred to as the Terrace I & II Expansion Projects. The first Certificate of Need for Line 4 issued in *In the Matter of Lakehead Pipe Line Company, Limited Partnership, for a Certificate of Need for a Large Petroleum Pipeline Facility*, Docket PL9/CN-98-327, to Lakehead Pipe Line Company (Enbridge's predecessor in interest) ("Lakehead"), authorized Lakehead to construct new pipe from the ND border to an existing 48-inch diameter pipe, which new pipeline it name "Line 4". Lakehead's Application for a Certificate of Need stated that Line 4 's "ultimate annual capacity will be 726,400 BPD." Application Section 7853.530, page 2 (available at: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={D01C3C30-AE85-40A1-A156-B0F8AA06A504}&documentTitle=323223 .)

The second Certificate of Need issued for Line 4 was in *In the Matter of the Application by Lakehead Pipe Line Company, Limited Partnership, for a Certificate of Need for a Large Petroleum Pipeline Facility*, PL9/CN-01-1092. Lakehead stated in its Application for this Certificate of Need (July 16, 2001) that Line 4's "ultimate annual capacity will be 720,400 BPD." Application Section 7853.0530 page 2 (available at: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7bC28B25CC-92EA-4ACE-89DA-5286876721B0%7d&documentTitle=241029). The resulting order granting a certificate of need did not further elaborate on this capacity. (Order available at https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={B20EF0EA-D4E5-44AF-9690-6AFD6B85BAE5}&documentTitle=241051 .) Thus, while it is certain that the Commission permitted Line 4, apparently Enbridge increased the line's annual capacity to 796,000 bpd subsequent to issuance of its certificates of need.

The Commission permitted Line 67 in three separate certificate of need hearings, an initial hearing in 2009 that permitted an annual capacity of 450,000 bpd; a Phase 1 upgrade project that permitted it to operate at an annual capacity of 570,000 bpd; and a Phase 2 upgrade project that permitted it to operate at an "annual capacity" of 800,000 bpd. *In the Matter of the Application of Enbridge Energy, Limited Partnership for a Certificate of Need for the Line 67 (Alberta Clipper) Station Upgrade Project - Phase 2 - in Marshall, Clearwater, Itasca, Kittson, Red Lake, Cass, and St. Louis Counties*, Docket No. PL9/CN-13-153, Order Granting Certificate of Need (Nov. 7, 2014) at 5; *see also* Application for a Certificate of Need in Docket PL9/CN-13-153, Section 7853.0230 page 12, Table 7853.0230-1-D.1. The "design capacity" of Line 67 is listed as 880,000 bpd.

pipelines of different sizes, pressures, and capacities. The proposed physical modification of the Superior Terminal described in the PSD Application includes installation of one additional "vacuum breaker"[40] on each of 21 large storage tanks in the Superior Terminal.[41] The additional vacuum breakers are intended to allow a faster rate of crude oil withdrawal from these storage tanks, which faster withdraw results from the faster movement of crude oil into and out of the terminal caused by the proposed pipeline capacity additions.[42]

According to the PSD Application, the proposed increase in the maximum flow of oil into the Superior Terminal would be accomplished by:

1) increasing the capacity of Line 4 from its current "average annual" capacity of 796,000 bpd[43] to a new capacity of 884,500 bpd,[44] an increase of 88,500 bpd or 11.1 percent; and
2) increasing the capacity of Line 67 from its current "average annual" capacity of 800,000 bpd[45] to a new capacity of 889,900 bpd,[46] an increase in throughput of 89,900 bpd or 11.2 percent.

[40] Vacuum breakers are mounted on petroleum storage tanks to allow for the rapid inflow of atmospheric air into a tank to reduce vacuum conditions caused by rapid pumping of oil out of the tank. For a video description of vacuum breaker functions see: https://www.youtube.com/watch?v=7r5HdImfVVY.
[41] *Id*. at 3, 5 ("The addition of a vacuum breaker results in the storage tanks being physically modified . . .").
[42] *Id*. at App. B, Table 1-1, n. 4 ("Existing modified storage tanks which may realize an increased utilization as a result of the proposed pipeline throughput capacity increases and require the construction of one additional vacuum breaker per tank to accommodate the increased withdrawal rate from the tanks." (Emphasis added.)
[43] PSD Application at 2; for a list of Enbridge Mainline System pipelines and their average annual capacities, see Enbridge Pipeline System Configuration sheet for Q1,2020, Attachment C, including "Note" regarding capacities.
[44] PSD Application at 2.
[45] *Id*.
[46] PSD Application at 2-3.

88,500 bpd plus 89,900 bpd equals 178,400 bpd. The PSD Application does not describe in detail how Enbridge will modify use of Lines 4 and 67 to allow a greater flow of crude oil through these pipelines, and instead states only that:

> Enbridge has identified optimizations and efficiencies on Line 4 such that it is potentially capable of operating above the current annual average pipeline capacity. The current permitted annual average pipeline capacity is 90% of the maximum constructed design capacity. Through this Project, Enbridge proposes to increase the throughput representation for Line 4 at the as-constructed maximum designed capacity of 884,500 bpd to account for this operational optimization.[47]
>
> * * *
>
> Enbridge has identified optimizations and efficiencies on Line 67 such that it is potentially capable of operating above the current annual average pipeline capacity. Through this Project, Enbridge proposes to increase the throughput representation for Line 67 at the as-constructed maximum designed capacity of 889,900 bpd to account for this operational optimization.[48]

In other words, Enbridge has figured how to increase the physical throughput of crude oil on Lines 4 and 67 by just over 11 percent of their "current permitted" capacities by optimizing operations and making more efficient use of these pipelines.

The fact that Enbridge claims that delivery of crude oil into the Superior Terminal will total 3,213,400 as a result of increasing the capacities of Lines 4 and 67 indicates that it plans to increase the "design" capacities of these pipelines, which would result in corresponding increases in their permitted "average annual" and "effective" capacities.

Following optimization of Lines 4 and 67 and installation of the vacuum breakers proposed by the PSD Application, the "design," "annual average," and "effective" capacities of the Mainline System can be estimated by assuming that the proposed capacity additions are to

[47] PSD Application at 2.
[48] *Id.*

their "design" capacities and then calculating the corresponding "annual average," and "effective" capacities.

2020 Mainline System Pipeline Capacity Plus Lines 4 and 67 Capacity Additions – Estimated in Service 2021				
Pipeline Name	**Terminus**	**Design Capacity (bpd)[49]**	**Average Annual Capacity @ 90% of Design Capacity (bpd)[50]**	**Effective Capacity @ 97% of Average Annual Capacity (bpd)[51]**
Line 1	Superior	263,000	237,000	230,000
Lines2A/2B	Superior	491,000	442,000	429,000
Line 3	Superior	478,000	430,000	417,000
Line 4	Superior	972,500	875,250	848,992
Line 65	Clearbrook	207,000	186,000	180,000
Line 67	Superior	978,900	881,010	854,590
Total Import Capacity at Border		3,390,400	3,051,260	2,959,582
Total into Superior Terminal		**3,183,400**	**2,865,260**	**2,779,582**
PSD Application Estimate (+30,000 bpd greater than calculated estimate)[52]		3,213,400	2,892,060	2,805,298

While there is some question about the 30,000 bpd difference between the PSD Application figure for maximum deliveries into the Superior Terminal and the calculated estimates, the fact that Enbridge estimates a maximum capacity into the Superior Terminal from a "design" capacity of 3,005,000 bpd to the PSD Application figure of 3,213,400 bpd indicates that

[49] Figures for Lines 1, 2, 3, and 65 calculated by dividing "average annual" capacities by 0.9; figures for Lines 4 and 67 calculated by addition the capacity additions identified in the PSD Application to their calculated 2020 design capacities.
[50] Figures for Lines 1, 2, 3, and 65 from Attachment C; figures for Lines 4 and 67 calculated by multiplying their design capacities by 0.9.
[51] Calculated by multiplying "average annual" capacities by 0.97, the "effective" capacity limit identified in Enbridge's response to Honor the Earth Information Request 14.f.
[52] The reason that the PSD Application maximum deliveries to the Superior Refinery are 30,000 bpd greater than the calculated amount is unknown.

Enbridge is planning to increase the permitted "design" and "annual average" capacities of Lines 4 and 67 to transport up to 178,400 bpd more crude oil through Minnesota.

VIII. Enbridge Continues to Plan to Reverse Line 13, Which Would Add Approximately 150,000 bpd of New Import Capacity

Page 42 of Enbridge's September 2020 Investor Day Presentation shows that Enbridge is still planning to reverse its Southern Lights Pipeline (Line 13) to allow import of an additional 150,000 bpd of crude oil. Attachment G. Although the exact timing of this reversal is not known by Enbridge, the fact that Enbridge has identified it to its investors for many years indicates that Enbridge considers this project viable.

IX. Enbridge Has Increased the Capacity of the Express Pipeline by 50,000 bpd, Which Pipeline Enbridge Owns and Uses to Transports Canadian crude oil to Midwest and Gulf Coast Markets

According to Enbridge's Response to Honor the Earth's Information Request 17.c,[53] Enbridge expected to increase the capacity of its Express Pipeline by 50,000 bpd in the first quarter of 2020, such that it is likely that this pipeline is operating at this higher capacity. This capacity addition was accomplished by "the addition of DRA skids on Express pipeline pump stations, pump impeller trims, as well as the modifications to relief and metering facilities at Hardisty, Buffalo, Edgar and Casper Terminals."[54] Therefore, Enbridge has increased import capacity from Canada through upgrades to this pipeline.

[53] Attachment E.
[54] *Id*.

ARGUMENT

I. PETITION FOR INVESTIGATION

The evidence present herein shows that between 2016 and 2020, Enbridge increased actual shipments on the Mainline System to over 2.8 million bpd on a sustained basis, with February shipments exceeding 2.9 million bpd. These actual shipments are as much as approximately 500,000 bpd greater than the capacity cap of 2,417,000 bpd Enbridge claimed in its L3RP need and apportionment testimony. Moreover, Enbridge reported to the Canadian Energy Regulator that the "available" capacity of the Mainline System averaged 2,949,497 bpd in the first half of 2020.[55] This "available" capacity is 532,497 bpd or 22 percent greater than the capacity cap. By way of comparison, the L3RP would provide a net capacity increase of 370,000 bpd, or a net capacity addition of 15.3 percent, and result in a total effective Mainline System capacity of 2,757,000 bpd.[56] To Honor the Earth's knowledge, Enbridge has not disclosed the existence or amount of these completed capacity additions to the Commission, even though the data shows that Enbridge began increasing its "effective" or "available" capacity starting in 2016 – before the L3RP evidentiary hearing. Presumably, Enbridge started efforts toward creating capacity additions other than the L3RP even before 2016.

The FERC Mainline System utilization data is partially corroborated by Enbridge's responses to Honor the Earth Information Requests 14, 15, 16, and 17, that Enbridge optimized the Mainline System to create about 220,000 bpd of new capacity between 2016 and 2018, and that Enbridge further increased the capacity of the Mainline System by another 150,000 bpd in 2019 and 2020,[57] for a total of 370,000 bpd of additional capacity above the L3RP capacity cap.

[55] Attachment B.
[56] Glanzer Rebuttal Testimony at Schedule 3, page 3 of 26.
[57] Attachment E.

However, Enbridge's claims about the timing of these capacity additions appear to be inconsistent with the "available" capacity data provided to the CER. The CER data shows Enbridge increased its available capacity by January 2016 to 2,812,005 bpd, and that with the exception of a few dips, Mainline System "available" capacity continued to be near 2,800,000 bpd until January 2020, when it increased to approximately 2,950,000 bpd, which is a total increase in "effective" or "available" capacity of approximately 533,000 bpd.[58] The 370,000 bpd capacity additions from 2016 to 2020 confirmed by Enbridge do not account for the entire actual additional oil flows or the 500,000-plus "available" capacity addition reported to the CER. The Commission should investigate how Enbridge achieved such a large capacity addition to "available" and "effective" capacity without construction of a new pipeline, and it should determine if Enbridge increased the "nameplate" capacity of any single previously certified pipeline by more than 10 percent to accomplish this feat.

The timing of Enbridge's capacity additions and evidence from the FERC and CER data of actual crude oil flows hundreds of thousands of barrels per day larger than the "effective" capacity cap of 2,417,000 bpd used by Enbridge's commercial need and apportionment experts, cast significant doubt on the efficacy of Enbridge's commercial need and apportionment analyses. It was not appropriate for Enbridge to use this cap as the basis for its need and apportionment quantitative analyses when it should have known from its own efficiency enhancement efforts and real-time flow data that the Mainline System was already exceeding the cap during the L3RP evidentiary hearing and flows would likely increase even more. It would be unreasonable to assume that such efficiency-based enhancements were temporary, because presumably the analysis, learning, and upgrades required to operate the Mainline System more efficiently would not be lost or become unusable.

[58] Attachment B.

The completed capacity additions should be investigated in the context of Enbridge's imminent capacity additions of Lines 4 and 67 by a total of 178,400 bpd. Since over 500,000 bpd in capacity additions were achieved by 2020 Q1, then the capacity additions proposed by Enbridge for Lines 4 and 67 are in addition. The 2020 Q1 FERC and CER throughput data would not seem to be dependent on the proposed capacity additions for Lines 4 and 67 contained in the PSD Application, which presumably would not be implemented before the PSD permit is granted. Once the capacities of Lines 4 and 67 are optimized and the Superior Terminal modified, it appears that Enbridge would be able to transport over 3.2 million bpd ("design" capacity) through Minnesota, creating a total increase in "effective" / "available" capacity to approximately 3 million bpd, an increase of 678,000 bpd – without the L3RP. Together, these efficiency-based capacity additions are significantly larger than the 370,000 bpd net capacity addition that Enbridge claimed would be accomplished by the L3RP.

Investigation of Enbridge's competed and planned capacity additions is also important because the Commission in the L3RP docket did not consider a need beyond the 370,000 bpd of additional capacity that would be provided by the L3RP. The Commission granted a Certificate of Need to replace existing Line 3, which at that time had a capacity of 390,000 bpd, with a new pipeline rated at 760,000 bpd, so as to increase Enbridge's crude oil import "average annual" capacity by an additional 370,000 bpd.[59] As stated by the Commission:

> Enbridge applied for a certificate of need for a pipeline that would have an annual average capacity of 760 kbpd because that is, on average, the highest volume of oil that it expects to be able to transport considering the full design capacity of the pipeline and

[59] *Order Granting Certificate of Need as Modified and Requiring Filings*, Sept. 5, 2018, at 18 ("CN Order"). One of the conditions of the L3RP Certificate of Need is decommissioning of existing Line 3; therefore, the Commission found a need for a net additional 370,000 bpd of crude oil transportation capacity beyond the Mainline System limits claimed in the L3RP evidentiary hearing.

> the operating conditions listed previously, and the certificate of need will therefore limit the Project's operation to that level.[60]

The Commission did not evaluate whether a need beyond 370,0000 bpd existed, because it found that consideration of further capacity additions was not within the scope of its docket. It did not find that a greater need or infinite need for additional crude oil transportation capacity existed beyond the net increase provided by the L3RP. The Commission also found that capacity additions to a new Line 3 Pipeline beyond the 370,000 bpd it approved in the L3RP would require a new certificate of need. Since the Commission expressly refused to consider need for capacity additions beyond an additional 370,000 bpd,[61] the commercial need for additional pipeline capacity on which the L3RP Certificate of Need is based has been more than met entirely through more efficient use of and upgrades to existing pipelines. As such, the L3RP record no longer justifies the L3RP Certificate of Need.[62]

Moreover, page 42 of Enbridge's September 2020 Investor Day Presentation shows that Enbridge is still planning to reverse its Southern Lights Pipeline (Line 13) to allow import of an additional 150,000 bpd of crude oil.[63] When this pipeline is reversed, the total "design" capacity of the Mainline System could exceed 3.3 million bpd, a far greater total net capacity addition than could be provided by the L3RP. And, Enbridge has already added 50,000 bpd of new capacity to the Express Pipeline, which also serves to ship crude oil to U.S. Midwest and Gulf Coast refineries and export terminals. When the capacity additions from the planned Line 13 and likely completed Express Pipeline projects are added to its past capacity additions and to the

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[60] *Id*.
[61] CN Order at 17-18.
[62] Meeting need through capacity additions to existing pipelines is made relevant by Minn. Stat. § 216B.243, subd. 3(6), which requires that the Commission evaluate: "possible alternatives for satisfying the energy demand or transmission needs including but not limited to potential for increased efficiency and upgrading of existing . . . transmission facilities . . . ."
[63] Attachment G.

Lines 4 and 67 capacity additions, it appears that Enbridge has already increased its import capacity to over 700,000 bpd, and has the ability to add another 150,000 bpd to this total.

The foregoing evidence marks a dramatic departure from the forecasts and data presented by Enbridge in the L3RP evidentiary hearing, which was relied on by the Commission in its approval of the Certificate of Need for the Project. By failing to inform the Commission of its ongoing and imminent plans to increase the actual throughput of the Mainline System, and instead presenting evidence that the Mainline System had an "effective" capacity cap of 2,417,000 bpd through 2035, Enbridge created a situation where it could argue for a new pipeline while hedging its bets through more efficient use and upgrades to its existing pipelines without telling the Commission that it was doing so.

Given the significant public interest in the L3RP and the serious injuries it would cause to Minnesota's indigenous peoples, water, land, and air, it is difficult to see how the L3RP is in the public interest in light of the apparent fact that Enbridge has already achieved the L3RP's capacity addition goals through other less impactful means. The Commission should provide the public with an opportunity to better understand this situation and account for how Enbridge managed to get more new capacity than is possible through the L3RP without building any substantial new infrastructure.

For the foregoing reasons, Honor the Earth requests that the Commission conduct an investigation into Enbridge's completed Mainline System capacity additions, as well as all of its planned future capacity additions. Such investigation is necessary to confirm Enbridge's compliance with Minn. R. 7853.0800, to provide the Commission with information about the capacity status of the crude oil pipelines within its jurisdiction, and to allow the public to better understand this unusual situation.

II. COMPLAINT

The evidence presented herein proves that Enbridge intends to increase the capacities of its Lines 4 and 67 by 10 percent or more of their current permitted[64] capacities. As such, under Minn. R. 7853.0800, subd. 2, Enbridge is required to seek "recertification" of these pipelines. Honor the Earth is not aware of any dockets in which the Commission considered an application or petition for recertification, but this is not surprising since prior known capacity additions have been greater than 20 percent, such that the full requirements of Minn. R. ch. 7853 apply to them. In any case, the apparent lack of prior recertification hearings does not change the plain language of Minn. R. 7853.0800.

Enbridge may attempt to characterize the capacity additions to Lines 4 and 67 as being based on a redefinition of capacity, but the evidence shows that:

1) these capacity additions require physical modifications to 21 large storage tanks in the Superior Terminal[65] to allow a faster flow of crude oil through the terminal, which faster flow is caused by a corresponding faster flow through Lines 4 and 67 in Minnesota,[66] such that the change in operations planned for Lines 4 and 67 are in fact additions to the physical capacities of these pipelines and not redefinitions of capacity; and
2) the PSD Application states that, as a result of optimizations and efficiency improvements, the maximum combined delivery capacity of the Mainline System pipelines into the Superior Terminal will increase to 3,213,400,[67] which is substantially more oil than the current combined approved "design" capacities of the Mainline System pipelines that deliver crude oil to the Superior Terminal, which indicates that Enbridge's proposed

[64] *Supra* at n. 39.
[65] *Id*. at 3, 5 ("The addition of a vacuum breaker results in the storage tanks being physically modified . . .").
[66] *Id*. at App. B, Table 1-1, n. 4
[67] PSD Application at 2-3.

capacity additions are not mere redefinitions of capacity but rather additions to the "design" and "annual average" capacities of these pipelines.

Therefore, the evidence shows that Enbridge plans to increase the capacities of Lines 4 and 67 by 88,500 bpd and 89,900 bpd, respectively, and that these capacity additions are 10 percent or more of the permitted capacities previously approved by the Commission of 796,000 bpd and 800,000 bpd, respectively, regardless of whether the proposed capacity additions are in terms of "design" or "average annual" capacities. Since the evidence indicates that Enbridge plans to accomplish physical "capacity additions" to Lines 4 and 67 that will be 10 percent or more of their current permitted capacities, Minn. R. 7852.0800, subd. 2.A, requires that Enbridge seek recertification of these pipelines. Enbridge's failure to seek recertification violates Minn. R. 7853.0800, subp. 2.A, and as such is an appropriate subject of a complaint.

Enbridge may seek to argue that its proposed capacity additions are not subject to Minn. R. 7853.0800, because allegedly they do not require any physical modifications to Lines 4 or 67. Such argument fails because the plain language of the law is not limited to capacity additions that require physical modification. The PSD Application offers no specific information about how Enbridge will achieve its stated capacity increases, nor is it possible for Honor the Earth or the Commission to know such information absent a Commission inquiry, such that the means to be used by Enbridge are an appropriate subject for a recertification hearing and/or a Commission investigation of Mainline System capacity additions.

With regard to the potential adverse impacts of conducting a hearing on this Complaint, the dramatic drop in Mainline System utilization resulting from the global oil market crisis indicates that Enbridge currently has no need for additional pipeline capacity and is unlikely to need such capacity for the foreseeable future. The FERC data shows that Mainline System

utilization dropped to 2,430,259 bpd in 2020 Q2 leaving the Mainline System with approximately 400,000 bpd of unutilized capacity, relative to the peak flow in 2020 Q1.[68] Similarly, the CER data shows that total shipments dropped to 2,436,651 bpd in June 2020.[69] Moreover, the impacts of the pandemic continue to depress global demand for crude oil and likely will do so far at least another year, if not permanently.

Therefore, it is likely that Enbridge does not currently using its already completed efficiency-based capacity additions, does not need the imminent capacity additions to Lines 4 and 67, and does not need the capacity that would be provided by the L3RP. Given Enbridge's current unused capacity, a Commission order for a recertification hearing would very likely not have the slightest adverse impacts on imports of crude oil on the Mainline System.

Therefore, Honor the Earth requests that the Commission order Enbridge to file Petitions for Recertification of Lines 4 and 67.

CONCLUSION

For years the Commission refused to seriously consider the potential for Enbridge to add capacity through upgrades and more efficient use of its existing pipelines, as required by Minn. Stat. § 216B.243, subd. 3(6). Instead, the Commission relied blindly on Enbridge's apparently untrue claim that upgrades and efficiency-based capacity additions were not possible and that the Mainline System was capped at an "effective" capacity of 2,417,000 bpd. The Commission's unjustified reliance on these claims resulted in a failure by the Commission to order its staff or the Department of Commerce to independently analyze Enbridge's ability to add capacity through efficiency improvements and upgrades, as required by Minn. Stat. § 216B.243, subd. 3(6). The Commission's failure to take a "hard look" at evidence of Enbridge's ability to add

[68] Attachment A.
[69] Attachment B.

capacity through upgrades and more efficient use of its existing pipelines, as required by law, means that the Commission unnecessarily approved construction of a new pipeline, because the capacity addition approved by the Commission has been otherwise met through upgrades and efficiency improvements. To rectify this situation, the Commission should order an investigation of Enbridge's past and planned pipeline upgrades and efficiency-based capacity additions, and it should order a recertification hearing for Lines 4 and 67.

RELIEF REQUESTED

For the foregoing reasons, Honor the Earth requests that the Commission:

- pursuant to Minn. Stat. § 216B.14, open an investigation into Enbridge's Mainline System completed pipeline capacity additions from 2016 to 2020, its planned capacity additions for Lines 4 and 67, its planned capacity addition resulting from reversal of Line 13, and other possible planned pipeline capacity additions other than the Line 3 Replacement Project; and
- pursuant to Minn. R. 7853.0800, order Enbridge to seek recertification for its proposed capacity additions for Lines 4 and 67, and any other permitted pipelines for which the average annual capacity has increased by 10 percent or more.

Dated: October 27, 2020

Respectfully submitted,

/s Paul C. Blackburn

Paul C. Blackburn
Staff Attorney
Honor the Earth
607 Main Avenue
Callaway, MN 56521
612-599-5568
paul@honorearth.org

Frank Bibeau
51124 County Road 118
Deer River, Minnesota 56636
218-760-1258
frankbibeau@gmail.com

Attorneys for Honor the Earth

ATTACHMENTS

Attachment A	Federal Energy Regulatory Commission, Enbridge Mainline System Form 6 and 6Q Shipment Data, January 2014 to June 2020
Attachment B	Canadian Energy Regulator, Enbridge Mainline System Shipment and Capacity Data, January 2014 to June 2020
Attachment C	Enbridge, System Configuration Documents 2016 to 2020
Attachment D	Bloomberg, *Pipelines Add Room on 'Unrelenting' Demand for Canada's Oil*, Aug. 1, 2019
Attachment E	Enbridge, Public Responses to Honor the Earth Information Requests 14, 15, 16, and 17
Attachment F	Enbridge, *Prevention of Significant Deterioration Permit Application for the Superior Terminal Enhancements 2020 Project*, submitted to Wisconsin Department of Natural Resources January 17, 2020
Attachment G	Enbridge, September 2020 Investor Day Presentation Page 42

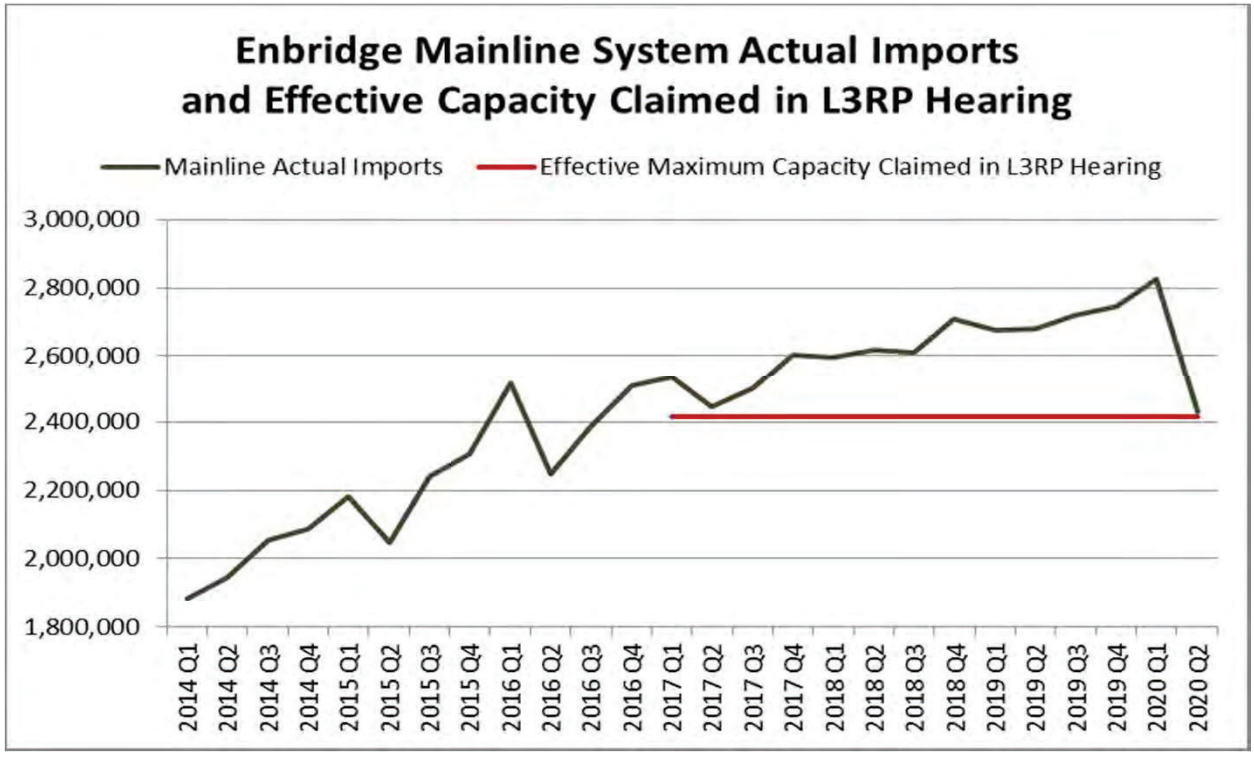
Attachment A

Federal Energy Regulatory Commission, Enbridge Mainline System Form 6 and 6Q Shipment Data, January 2014 to June 2020

Federal Energy Regulatory Commission

Enbridge Mainline System Form 6 and 6Q Data

FERC Form 6	Mainline Actual Imports (bpd)	"Effective" Maximum Capacity Claimed by Enbridge in Evidentiary Hearing (bpd)
2014 Q1	1,884,398	
2014 Q2	1,945,030	
2014 Q3	2,054,950	
2014 Q4	2,085,885	
2015 Q1	2,182,380	
2015 Q2	2,048,917	
2015 Q3	2,242,787	
2015 Q4	2,305,292	
2016 Q1	2,514,381	
2016 Q2	2,250,031	
2016 Q3	2,386,522	
2016 Q4	2,507,908	
2017 Q1	2,535,182	2,417,000
2017 Q2	2,447,618	2,417,000
2017 Q3	2,501,138	2,417,000
2017 Q4	2,602,265	2,417,000
2018 Q1	2,597,565	2,417,000
2018 Q2	2,616,650	2,417,000
2018 Q3	2,611,639	2,417,000
2018 Q4	2,707,517	2,417,000
2019 Q1	2,674,502	2,417,000
2019 Q2	2,678,196	2,417,000
2019 Q3	2,718,347	2,417,000
2019 Q4	2,744,542	2,417,000
2020 Q1	2,826,172	2,417,000
2020 Q2	2,430,259	2,417,000


Enbridge Mainline System Actual Imports
and Effective Capacity Claimed in L3RP Hearing
Mainline Actual Imports
Effective Maximum Capacity Claimed in L3RP Hearing
3,000,000
2,800,000
2,600,000
2,400,000
2,200,000
2,000,000
1,800,000
2014 Q1
2014 Q2
2014 Q3
2014 Q4
2015 Q1
2015 Q2
2015 Q3
2015 Q4
2016 Q1
2016 Q2
2016 Q3
2016 Q4
2017 Q1
2017 Q2
2017 Q3
2017 Q4
2018 Q1
2018 Q2
2018 Q3
2018 Q4
2019 Q1
2019 Q2
2019 Q3
2019 Q4
2020 Q1
2020 Q2

Attachment B

Canadian Energy Regulator, Enbridge Mainline System Shipment and Capacity Data, January 2014 to June 2020

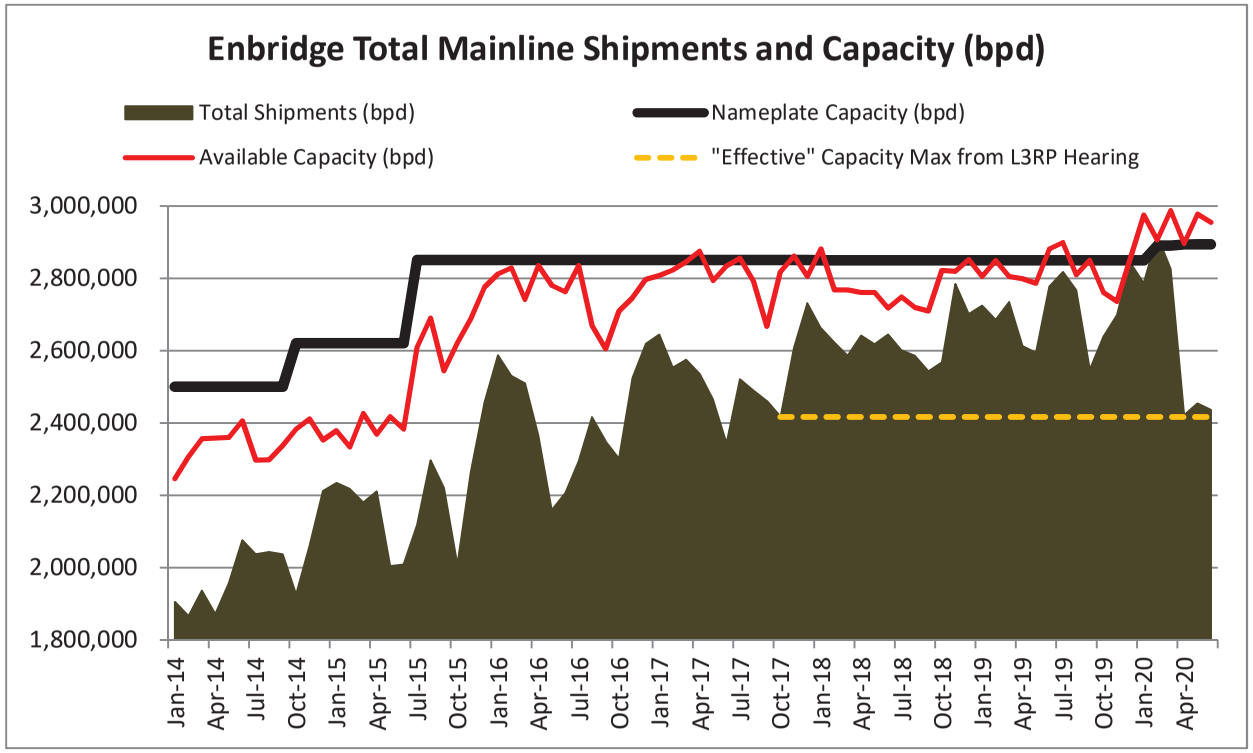
Canadian Energy Regulator Data

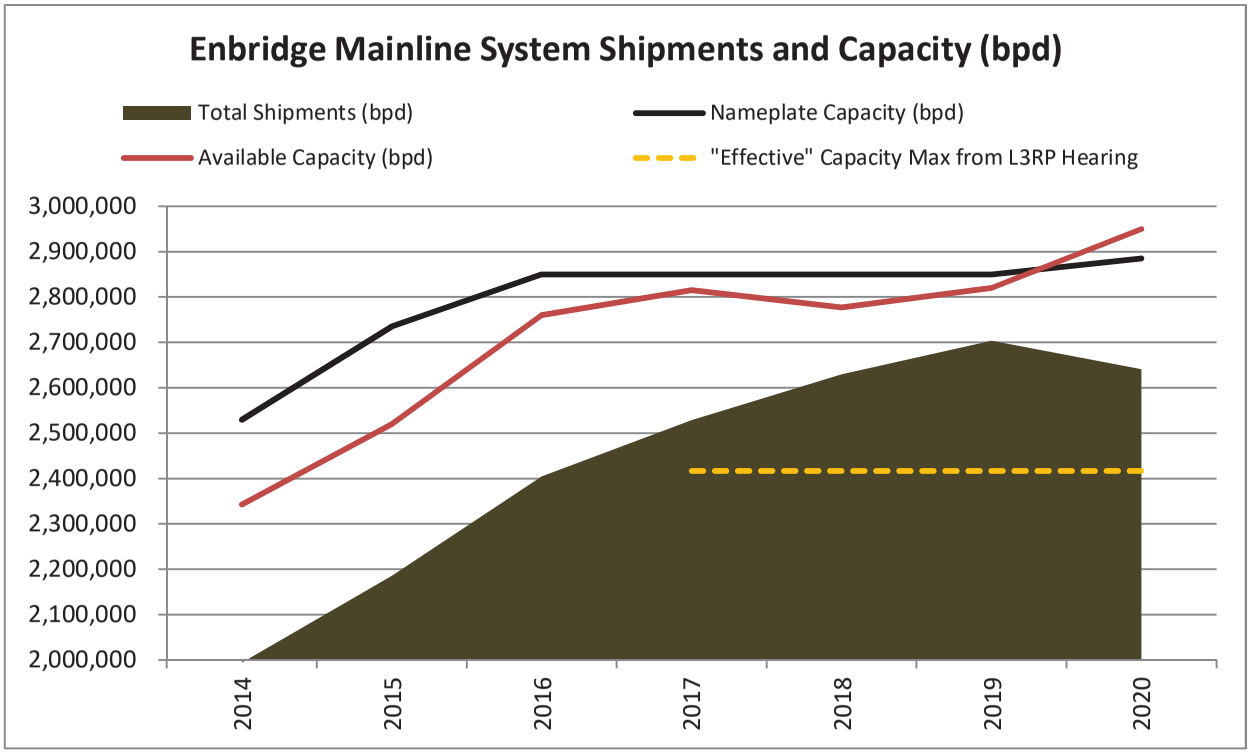
Enbridge Mainline System Data

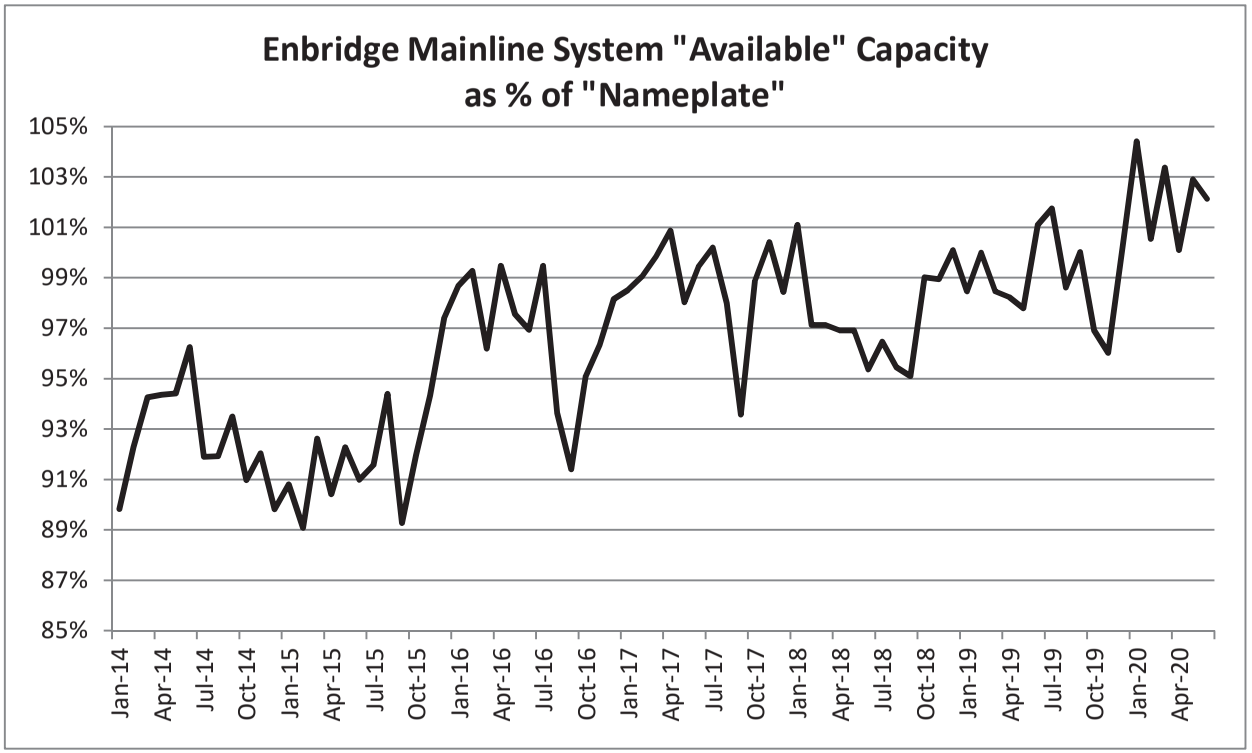
Month/ Year	Corporate Entity	Pipeline Name	Total Shipments (bpd)	Nameplate Capacity (bpd)	Available Capacity (bpd)	Available Capacity as % of Nameplate	"Effective" Capacity Max from L3RP Hearing
Jan-14	Enbridge Pipelines Inc.	Canadian Mainline	1,905,184	2,499,571	2,245,481	90%	
Feb-14	Enbridge Pipelines Inc.	Canadian Mainline	1,866,187	2,499,571	2,306,694	92%	
Mar-14	Enbridge Pipelines Inc.	Canadian Mainline	1,936,633	2,499,571	2,356,031	94%	
Apr-14	Enbridge Pipelines Inc.	Canadian Mainline	1,871,848	2,499,571	2,358,471	94%	
May-14	Enbridge Pipelines Inc.	Canadian Mainline	1,957,389	2,499,571	2,359,968	94%	
Jun-14	Enbridge Pipelines Inc.	Canadian Mainline	2,075,638	2,499,571	2,405,708	96%	
Jul-14	Enbridge Pipelines Inc.	Canadian Mainline	2,037,270	2,499,571	2,297,158	92%	
Aug-14	Enbridge Pipelines Inc.	Canadian Mainline	2,042,931	2,499,571	2,297,775	92%	
Sep-14	Enbridge Pipelines Inc.	Canadian Mainline	2,037,270	2,499,571	2,337,074	93%	
Oct-14	Enbridge Pipelines Inc.	Canadian Mainline	1,925,311	2,619,706	2,383,172	91%	
Nov-14	Enbridge Pipelines Inc.	Canadian Mainline	2,060,542	2,619,706	2,410,966	92%	
Dec-14	Enbridge Pipelines Inc.	Canadian Mainline	2,212,126	2,619,706	2,352,949	90%	
Jan-15	Enbridge Pipelines Inc.	Canadian Mainline	2,234,141	2,619,706	2,378,895	91%	
Feb-15	Enbridge Pipelines Inc.	Canadian Mainline	2,217,787	2,619,706	2,333,627	89%	
Mar-15	Enbridge Pipelines Inc.	Canadian Mainline	2,180,048	2,619,706	2,426,401	93%	
Apr-15	Enbridge Pipelines Inc.	Canadian Mainline	2,210,868	2,619,706	2,368,554	90%	
May-15	Enbridge Pipelines Inc.	Canadian Mainline	2,003,934	2,619,706	2,417,382	92%	
Jun-15	Enbridge Pipelines Inc.	Canadian Mainline	2,008,337	2,619,706	2,383,404	91%	
Jul-15	Enbridge Pipelines Inc.	Canadian Mainline	2,117,779	2,849,913	2,609,554	92%	
Aug-15	Enbridge Pipelines Inc.	Canadian Mainline	2,297,039	2,849,913	2,690,278	94%	
Sep-15	Enbridge Pipelines Inc.	Canadian Mainline	2,220,303	2,849,913	2,544,254	89%	
Oct-15	Enbridge Pipelines Inc.	Canadian Mainline	2,007,079	2,849,913	2,620,801	92%	
Nov-15	Enbridge Pipelines Inc.	Canadian Mainline	2,264,961	2,849,913	2,688,385	94%	
Dec-15	Enbridge Pipelines Inc.	Canadian Mainline	2,458,058	2,849,913	2,776,159	97%	
Jan-16	Enbridge Pipelines Inc.	Canadian Mainline	2,587,628	2,849,913	2,812,005	99%	
Feb-16	Enbridge Pipelines Inc.	Canadian Mainline	2,530,391	2,849,913	2,829,144	99%	
Mar-16	Enbridge Pipelines Inc.	Canadian Mainline	2,510,263	2,849,913	2,741,332	96%	

Apr-16	Enbridge Pipelines Inc.	Canadian Mainline	2,364,969	2,849,913	2,835,006	99%	
May-16	Enbridge Pipelines Inc.	Canadian Mainline	2,158,034	2,849,913	2,780,291	98%	
Jun-16	Enbridge Pipelines Inc.	Canadian Mainline	2,205,208	2,849,913	2,762,781	97%	
Jul-16	Enbridge Pipelines Inc.	Canadian Mainline	2,293,894	2,849,913	2,835,120	99%	
Aug-16	Enbridge Pipelines Inc.	Canadian Mainline	2,416,545	2,849,913	2,668,459	94%	
Sep-16	Enbridge Pipelines Inc.	Canadian Mainline	2,349,873	2,849,913	2,605,019	91%	
Oct-16	Enbridge Pipelines Inc.	Canadian Mainline	2,301,442	2,849,913	2,709,732	95%	
Nov-16	Enbridge Pipelines Inc.	Canadian Mainline	2,523,472	2,849,913	2,745,446	96%	
Dec-16	Enbridge Pipelines Inc.	Canadian Mainline	2,618,448	2,849,913	2,797,330	98%	
Jan-17	Enbridge Pipelines Inc.	Canadian Mainline	2,644,236	2,849,913	2,807,444	99%	
Feb-17	Enbridge Pipelines Inc.	Canadian Mainline	2,553,034	2,849,913	2,822,766	99%	
Mar-17	Enbridge Pipelines Inc.	Canadian Mainline	2,575,049	2,849,913	2,845,498	100%	
Apr-17	Enbridge Pipelines Inc.	Canadian Mainline	2,536,052	2,849,913	2,874,752	101%	
May-17	Enbridge Pipelines Inc.	Canadian Mainline	2,463,719	2,849,913	2,793,544	98%	
Jun-17	Enbridge Pipelines Inc.	Canadian Mainline	2,342,955	2,849,913	2,834,264	99%	
Jul-17	Enbridge Pipelines Inc.	Canadian Mainline	2,520,956	2,849,913	2,855,574	100%	
Aug-17	Enbridge Pipelines Inc.	Canadian Mainline	2,489,507	2,849,913	2,792,676	98%	
Sep-17	Enbridge Pipelines Inc.	Canadian Mainline	2,460,574	2,849,913	2,666,880	94%	
Oct-17	Enbridge Pipelines Inc.	Canadian Mainline	2,417,174	2,849,913	2,817,835	99%	2,417,000
Nov-17	Enbridge Pipelines Inc.	Canadian Mainline	2,608,385	2,849,913	2,861,864	100%	2,417,000
Dec-17	Enbridge Pipelines Inc.	Canadian Mainline	2,731,665	2,849,913	2,805,256	98%	2,417,000
Jan-18	Enbridge Pipelines Inc.	Canadian Mainline	2,662,477	2,849,284	2,880,733	101%	2,417,000
Feb-18	Enbridge Pipelines Inc.	Canadian Mainline	2,622,851	2,849,284	2,767,517	97%	2,417,000
Mar-18	Enbridge Pipelines Inc.	Canadian Mainline	2,585,741	2,849,284	2,767,517	97%	2,417,000
Apr-18	Enbridge Pipelines Inc.	Canadian Mainline	2,641,721	2,849,284	2,761,227	97%	2,417,000
May-18	Enbridge Pipelines Inc.	Canadian Mainline	2,617,819	2,849,284	2,761,227	97%	2,417,000
Jun-18	Enbridge Pipelines Inc.	Canadian Mainline	2,644,865	2,849,284	2,717,198	95%	2,417,000
Jul-18	Enbridge Pipelines Inc.	Canadian Mainline	2,600,837	2,849,284	2,748,679	96%	2,417,000
Aug-18	Enbridge Pipelines Inc.	Canadian Mainline	2,585,741	2,849,284	2,719,651	95%	2,417,000
Sep-18	Enbridge Pipelines Inc.	Canadian Mainline	2,542,971	2,849,284	2,709,468	95%	2,417,000
Oct-18	Enbridge Pipelines Inc.	Canadian Mainline	2,567,501	2,849,284	2,821,490	99%	2,417,000
Nov-18	Enbridge Pipelines Inc.	Canadian Mainline	2,784,499	2,849,284	2,819,093	99%	2,417,000
Dec-18	Enbridge Pipelines Inc.	Canadian Mainline	2,700,845	2,849,284	2,851,939	100%	2,417,000
Jan-19	Enbridge Pipelines Inc.	Canadian Mainline	2,724,746	2,849,284	2,805,256	98%	2,417,000

Feb-19	Enbridge Pipelines Inc.	Canadian Mainline	2,685,749	2,849,284	2,849,284	100%	2,417,000
Mar-19	Enbridge Pipelines Inc.	Canadian Mainline	2,734,810	2,849,284	2,805,256	98%	2,417,000
Apr-19	Enbridge Pipelines Inc.	Canadian Mainline	2,612,158	2,849,284	2,798,966	98%	2,417,000
May-19	Enbridge Pipelines Inc.	Canadian Mainline	2,593,918	2,849,284	2,786,386	98%	2,417,000
Jun-19	Enbridge Pipelines Inc.	Canadian Mainline	2,777,580	2,849,284	2,880,733	101%	2,417,000
Jul-19	Enbridge Pipelines Inc.	Canadian Mainline	2,817,382	2,849,284	2,899,005	102%	2,417,000
Aug-19	Enbridge Pipelines Inc.	Canadian Mainline	2,766,476	2,849,284	2,809,753	99%	2,417,000
Sep-19	Enbridge Pipelines Inc.	Canadian Mainline	2,548,580	2,849,284	2,849,894	100%	2,417,000
Oct-19	Enbridge Pipelines Inc.	Canadian Mainline	2,638,576	2,849,284	2,761,227	97%	2,417,000
Nov-19	Enbridge Pipelines Inc.	Canadian Mainline	2,697,071	2,849,284	2,736,068	96%	2,417,000
Dec-19	Enbridge Pipelines Inc.	Canadian Mainline	2,843,623	2,849,284	2,855,574	100%	2,417,000
Jan-20	Enbridge Pipelines Inc.	Canadian Mainline	2,786,462	2,849,284	2,975,081	104%	2,417,000
Feb-20	Enbridge Pipelines Inc.	Canadian Mainline	2,919,773	2,890,168	2,905,893	101%	2,417,000
Mar-20	Enbridge Pipelines Inc.	Canadian Mainline	2,825,028	2,890,168	2,987,660	103%	2,417,000
Apr-20	Enbridge Pipelines Inc.	Canadian Mainline	2,421,669	2,893,313	2,896,294	100%	2,417,000
May-20	Enbridge Pipelines Inc.	Canadian Mainline	2,454,469	2,893,313	2,977,169	103%	2,417,000
Jun-20	Enbridge Pipelines Inc.	Canadian Mainline	2,436,651	2,893,313	2,954,884	102%	2,417,000
Yearly Average							
2007			1,458,915	2,040,415	1,797,995	88%	
2008			1,522,045	2,063,477	1,803,132	87%	
2009			1,562,182	2,166,840	1,982,601	92%	
2010			1,537,077	2,248,136	2,096,446	93%	
2011			1,554,999	2,499,571	2,169,985	87%	
2012			1,646,576	2,499,571	2,148,232	86%	
2013			1,737,699	2,499,571	2,207,525	88%	
2014			1,994,027	2,529,605	2,342,621	93%	
2015			2,185,028	2,734,810	2,519,808	92%	
2016			2,405,014	2,849,913	2,760,139	97%	
2017			2,528,609	2,849,913	2,814,863	99%	2,417,000
2018			2,629,822	2,849,284	2,777,145	97%	2,417,000
2019			2,703,389	2,849,284	2,819,784	99%	2,417,000
2020			2,640,675	2,884,927	2,949,497	102%	2,417,000


Enbridge Total Mainline Shipments and Capacity (bpd)
Total Shipments (bpd)
Nameplate Capacity (bpd)
Available Capacity (bpd)
"Effective" Capacity Max from L3RP Hearing
3,000,000
2,800,000
2,600,000
2,400,000
2,200,000
2,000,000
1,800,000
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
Jan-17
Apr-17
Jul-17
Oct-17
Jan-18
Apr-18
Jul-18
Oct-18
Jan-19
Apr-19
Jul-19
Oct-19
Jan-20
Apr-20


Enbridge Mainline System Shipments and Capacity (bpd)
Total Shipments (bpd)
Nameplate Capacity (bpd)
Available Capacity (bpd)
"Effective" Capacity Max from L3RP Hearing
3,000,000
2,900,000
2,800,000
2,700,000
2,600,000
2,500,000
2,400,000
2,300,000
2,200,000
2,100,000
2,000,000
2014
2015
2016
2017
2018
2019
2020

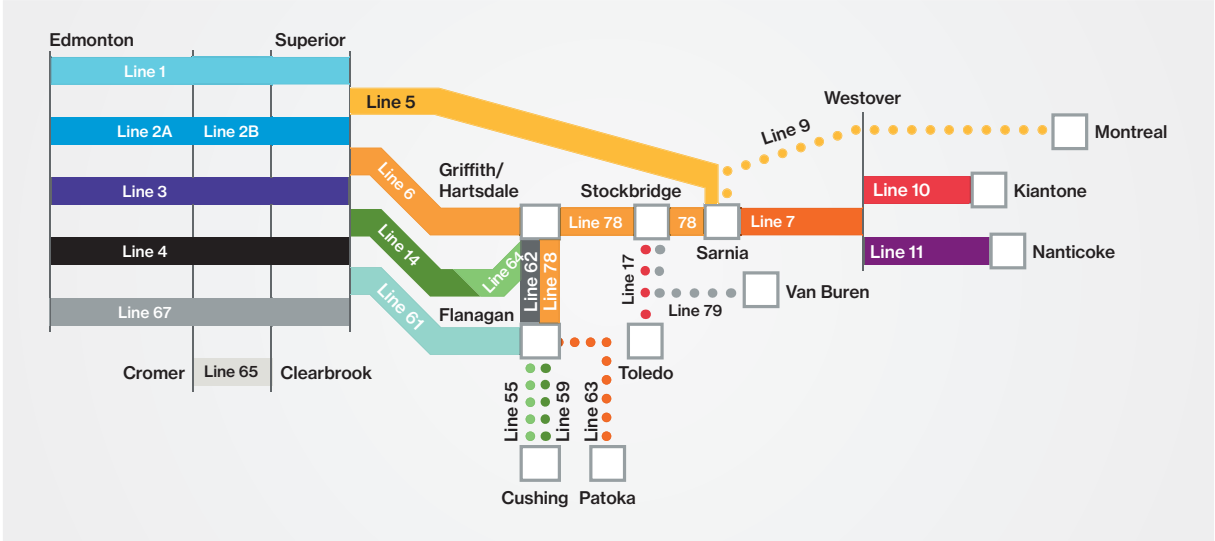

Enbridge Mainline System "Available" Capacity
as % of "Nameplate"
105%
103%
101%
99%
97%
95%
93%
91%
89%
87%
85%
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
Jan-17
Apr-17
Jul-17
Oct-17
Jan-18
Apr-18
Jul-18
Oct-18
Jan-19
Apr-19
Jul-19
Oct-19
Jan-20
Apr-20

Attachment C

Enbridge, System Configuration Documents 2016 to 2020

Pipeline System Configuration

Q1, 2016



Line 1
37,600 m³/d (237 kbpd)
18"/20" - 1098 miles
- NGL
- Refined Products
- Light

Line 2A
70,300 m³/d (442 kbpd)
24" - 596 miles
- Condensates
- Light

Line 2B
70,300 m³/d (442 kbpd)
24"/26" - 502 miles
- Light

Line 3
62,000 m³/d (390 kbpd)
34" - 1098 miles
- Condensates
(Edmonton to Hardisty)
- Light

Line 4
126,500 m³/d (796 kbpd)
36"/48" - 1098 miles
- Heavy
- Medium (Ex-Clearbrook)
- Light (Ex-Clearbrook)

Line 5
85,900 m³/d (540 kbpd)
30" - 645 miles
- NGL
- Light

Line 6
106,000 m³/d (667 kbpd)
34" - 467 miles
- Light
- Medium
- Heavy

Line 7
28,600 m³/d (180 kbpd)
20" - 120 miles
- Light
- Medium
- Heavy

Line 78
79,500 m³/d (500 kbpd)
30"/36" - 373 miles
- Light
- Medium
- Heavy

Line 65
29,500 m³/d (186 kbpd)
20" - 313 miles
- Light
- Medium

NOTE: Capacities provided are Annual Capacities and do not include current restrictions.

Line 10
11,800 m³/d (74 kbpd)
12"/20" - 91 miles
- Light
- Medium
- Heavy

Line 11
18,600 m³/d (117 kbpd)
16"/20" - 47 miles
- Condensates
- Light
- Medium
- Heavy

Line 62
37,400 m³/d (235 kbpd)
22" - 75 miles
- Heavy

Line 14/64
50,500 m³/d (318 kbpd)
24" - 467 miles
- Light
- Medium

Line 61
148,000 m³/d (931 kbpd)
42" - 454 miles
- Light
- Medium
- Heavy

Line 67
127,200 m³/d (800 kbpd)
36" - 1112 miles
- Heavy

Not part of the Enbridge Mainline System

Line 9
47,700 m³/d (300 kbpd)
30" - 517 miles
- Light
- Heavy

Line 17
16,000 m³/d (100 kbpd)
16" - 88 miles
- Heavy

Line 55
30,700 m³/d (193 kbpd)
22"/24" - 583 miles
- Light
- Medium
- Heavy

Line 59
93,000 m³/d (585 kbpd)
36" - 593 miles
- Light
- Heavy

Line 79
12,700 m³/d (80.0 kbpd)
20"/16" - 61 miles
- Heavy

Line 63
47,700 m³/d (300 kbpd)
24" - 168 miles
- Light
- Heavy

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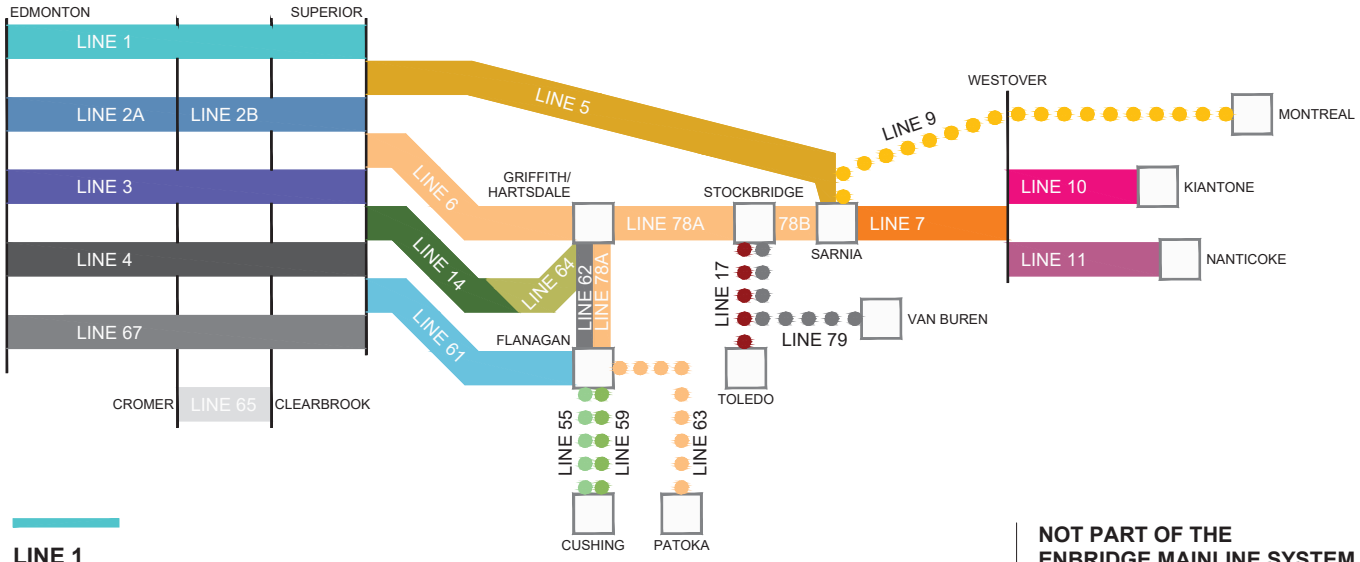
Pipeline System Configuration

Q1, 2017



LINE 1
37,600 m^3/d (237 kbpd)
18"/20" - 1767 km (1098 miles)
-NGL
-Refined Products
-Light

LINE 2A
70,300 m^3/d (442 kbpd)
24" - 966 km (600 miles)
-Condensates
-Light

LINE 2B
70,300 m^3/d (442 kbpd)
24"/26" - 808 km (502 miles)
-Light

LINE 3
62,000 m^3/d (390 kbpd)
34" - 1767 km (1098 miles)
-Light

LINE 4
126,500 m^3/d (796 kbpd)
36"/48" - 1770 km (1100 miles)
-Heavy
-Medium (Ex-Clearbrook)
-Light (Ex-Clearbrook)

LINE 5
85,900 m^3/d (540 kbpd)
30" - 1038 km (645 miles)
-NGL
-Light

LINE 6
106,000 m^3/d (667 kbpd)
34" - 748 km (465 miles)
-Light
-Medium
-Heavy

LINE 7
28,600 m^3/d (180 kbpd)
20" - 193 km (120 miles)
-Light
-Medium
-Heavy

LINE 78A
90,600 m^3/d (570 kbpd)
36" - 425 km (264 miles)
-Light
-Medium
-Heavy

LINE 78B
79,500 m^3/d (500 kbpd)
30" - 175 km (109 miles)
-Light
-Medium
-Heavy

LINE 65
29,500 m^3/d (186 kbpd)
20" - 504 km (313 miles)
-Light
-Medium

LINE 10
11,800 m^3/d (74 kbpd)
12"/20" - 143 km (89 miles)
-Light
-Medium
-Heavy

LINE 11
18,600 m^3/d (117 kbpd)
16"/20" - 76 km (47 miles)
-Light
-Medium
-Heavy

LINE 62
37,400 m^3/d (235 kbpd)
22" - 121 km (75 miles)
-Heavy

LINE 14/64
54,600 m^3/d (343 kbpd)
24" - 784 km (487 miles)
-Light
-Medium

LINE 61
151,700 m^3/d (954 kbpd)
42" - 744 km (462 miles)
-Light
-Medium
-Heavy

LINE 67
127,200 m^3/d (800 kbpd)
36" - 1790 km (1112 miles)
-Heavy

NOT PART OF THE ENBRIDGE MAINLINE SYSTEM

LINE 9
47,700 m^3/d (300 kbpd)
30" - 832 km (517 miles)
-Light
-Medium
-Heavy

LINE 17
16,000 m^3/d (100 kbpd)
16" - 142 km (88 miles)
-Light
-Medium
-Heavy

LINE 55
30,700 m^3/d (193 kbpd)
22"/24" - 938 km (583 miles)
-Light
-Medium
-Heavy

LINE 59
93,000 m^3/d (585 kbpd)
36" - 954 km (593 miles)
-Light
-Medium
-Heavy

LINE 79
12,700 m^3/d (80 kbpd)
20"/16" - 98 km (61 miles)
-Light
-Medium
-Heavy

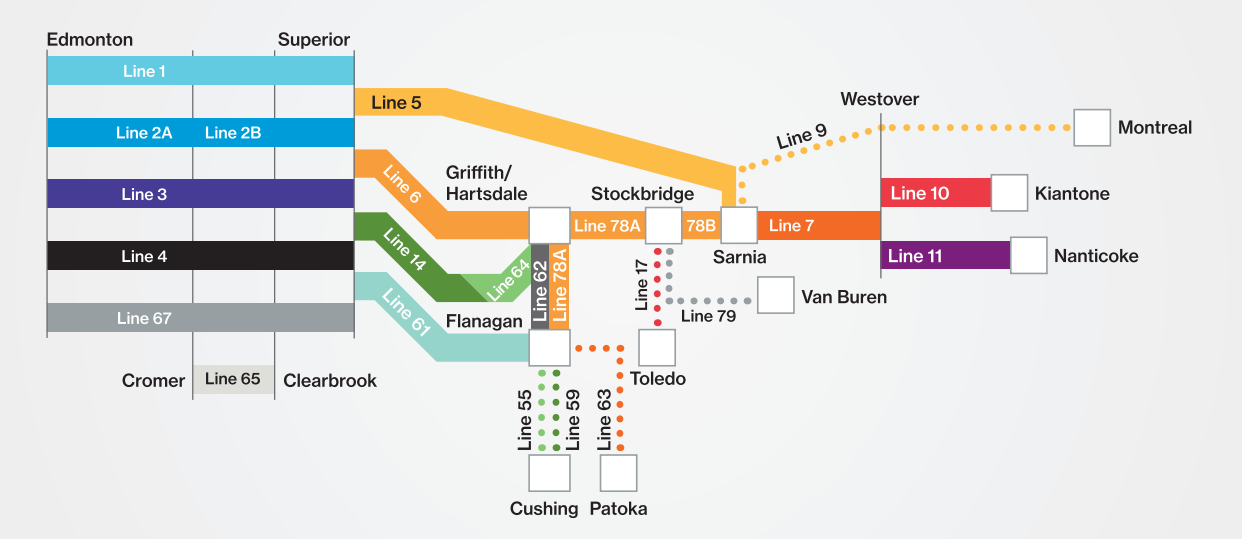
LINE 63
47,700 m^3/d (300 kbpd)
24" - 270 km (168 miles)
-Light
-Medium
-Heavy

NOTES:

Capacities provided are Annual Capacities and do not include current restrictions.

Pipeline System Configuration

Q1, 2018



Line 1

37,600 m3/d (237 kbpd)
18"/20" – 1,767 km (1,098 mi)
- NGL
- Refined Products
- Light

Line 2A

70,300 m³/d (442 kbpd)
24" – 966 km (600 mi)
- Condensates
- Light
- Heavy

Line 2B

70,300 m³/d (442 kbpd)
24"/26" – 808 km (502 mi)
(502 mi)
- Light

Line 3

62,000 m³/d (390 kbpd)
34" – 1,767 km (1,098 mi)
- Light
- Medium
- Heavy

Line 4

126,500 m³/d (796 kbpd)
36"/48" – 1,770 km (1,100 mi)
- Heavy
- Medium (Ex-Clearbrook)
- Light (Ex-Clearbrook)

Line 5

85,900 m³/d (540 kbpd)
30" – 1,038 km (645 mi)
- NGL
- Light

Line 6

106,000 m³/d (667 kbpd)
34" – 748 km (465 mi)
- Light
- Medium
- Heavy

Line 7

28,600 m³/d (180 kbpd)
20" – 193 km (120 mi)
- Light
- Medium
- Heavy

Line 78A

90,600 m³/d (570 kbpd)
36" – 425 km (264 mi)
- Light
- Medium
- Heavy

Line 78B

79,500 m³/d (500 kbpd)
30"/36" – 175 km (109 mi)
- Light
- Medium
- Heavy

Line 65

29,500 m³/d (186 kbpd)
20" – 504 km (313 mi)
- Light
- Medium

Line 10

11,800 m³/d (74 kbpd)
12"/20" – 143 km (89 mi)
- Light
- Medium
- Heavy

Line 11

18,600 m³/d (117 kbpd)
16"/20" – 76 km (47 mi)
- Light
- Medium
- Heavy

Line 62

37,400 m³/d (235 kbpd)
22" – 121 km (75 mi)
- Heavy

Line 14/64

54,600 m³/d (343 kbpd)
24" – 784 km (487 mi)
- Light
- Medium

Line 61

158,300 m³/d (996 kbpd)
42" – 744 km (462 mi)
- Light
- Medium
- Heavy

Line 67

127,200 m3/d (800 kbpd)
36" – 1,790 km (1,112 mi)
- Heavy

Not part of the Enbridge Mainline System

Line 9

47,700 m³/d (300 kbpd)
30" – 832 km (517 mi)
- Light
- Medium
- Heavy

Line 17

16,000 m³/d (100 kbpd)
16" – 142 km (88 mi)
- Light
- Medium
- Heavy

Line 55

30,700 m³/d (193 kbpd)
22"/24" – 938 km (583 mi)
- Light
- Medium
- Heavy

Line 59

93,000 m³/d (585 kbpd)
36" – 954 km (593 mi)
- Light
- Medium
- Heavy

Line 79

12,700 m³/d (80 kbpd)
20"/16" – 98 km (61 mi)
- Light
- Medium
- Heavy

Line 63

47,700 m³/d (300 kbpd)
24" – 270 km (168 mi)
- Light
- Medium
- Heavy

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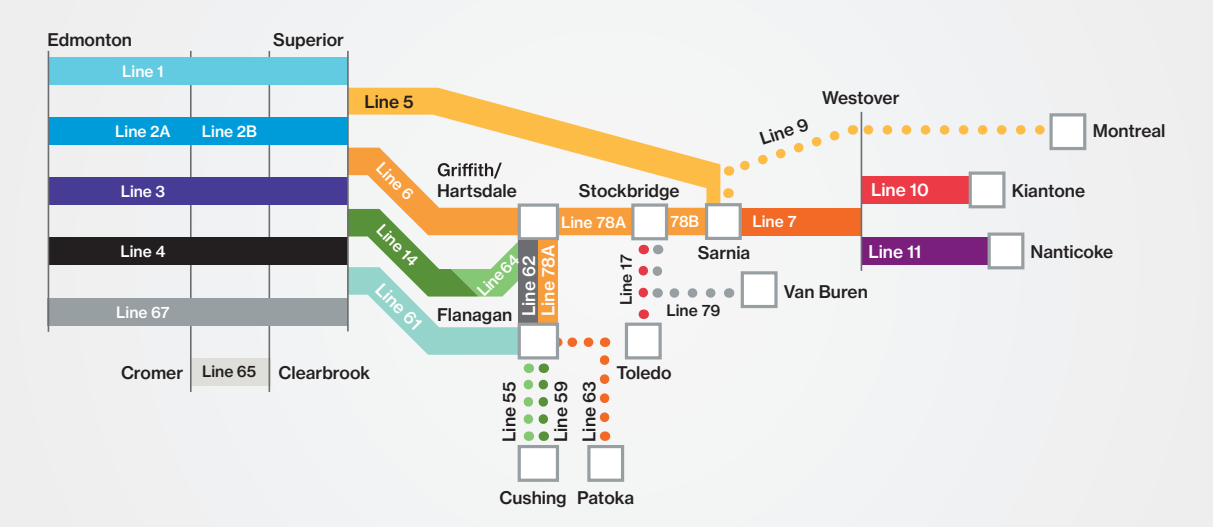
NOTE: Capacities provided are Annual Capacities and do not include current restrictions.

Pipeline System Configuration

Q1, 2019



Line 1
37,600 m3/d (237 kbpd)
18"/20" – 1,767 km (1,098 mi)
- NGL
- Refined Products
- Light

Line 2A
70,300 m³/d (442 kbpd)
24" – 966 km (600 mi)
- Condensates
- Light

Line 2B
70,300 m³/d (442 kbpd)
24"/26" – 808 km (502 mi)
- Light

Line 3
62,000 m³/d (390 kbpd)
34" – 1,767 km (1,098 mi)
- Light

Line 4
126,500 m³/d (796 kbpd)
36"/48" – 1,770 km (1,100 mi)
- Heavy
- Medium (Ex-Clearbrook)
- Light (Ex-Clearbrook)

Line 5
85,900 m³/d (540 kbpd)
30" – 1,038 km (645 mi)
- NGL
- Light

Line 6
106,000 m³/d (667 kbpd)
34" – 748 km (465 mi)
- Light
- Medium
- Heavy

Line 7
28,600 m³/d (180 kbpd)
20" – 193 km (120 mi)
- Light
- Medium
- Heavy

Line 78A
90,600 m³/d (570 kbpd)
36" – 425 km (264 mi)
- Light
- Medium
- Heavy

Line 78B
79,500 m³/d (500 kbpd)
30"/36" – 175 km (109 mi)
- Light
- Medium
- Heavy

Line 65
29,500 m³/d (186 kbpd)
20" – 504 km (313 mi)
- Light
- Medium

Line 10
11,800 m³/d (74 kbpd)
12"/20" – 143 km (89 mi)
- Light
- Medium
- Heavy

Line 11
18,600 m³/d (117 kbpd)
16"/20" – 76 km (47 mi)
- Light
- Medium
- Heavy

Line 62
37,400 m³/d (235 kbpd)
22" – 121 km (75 mi)
- Heavy

Line 14/64
54,600 m³/d (343 kbpd)
24" – 784 km (487 mi)
- Light
- Medium

Line 61
151,700 m³/d (954 kbpd)
42" – 744 km (462 mi)
- Light
- Medium
- Heavy

Line 67
127,200 m³/d (800 kbpd)
36" – 1,790 km (1,112 mi)
- Heavy

Not part of the Enbridge Mainline System

Line 9
47,700 m³/d (300 kbpd)
30" – 832 km (517 mi)
- Light
- Medium
- Heavy

Line 17
16,000 m³/d (100 kbpd)
16" – 142 km (88 mi)
- Light
- Medium
- Heavy

Line 55
30,700 m³/d (193 kbpd)
22"/24" – 938 km (583 mi)
- Light
- Medium
- Heavy

Line 59
93,000 m³/d (585 kbpd)
36" – 954 km (593 mi)
- Light
- Medium
- Heavy

Line 79
12,700 m³/d (80 kbpd)
20"/16" – 98 km (61 mi)
- Light
- Medium
- Heavy

Line 63
47,700 m³/d (300 kbpd)
24" – 270 km (168 mi)
- Light
- Medium
- Heavy

ENBRIDGE
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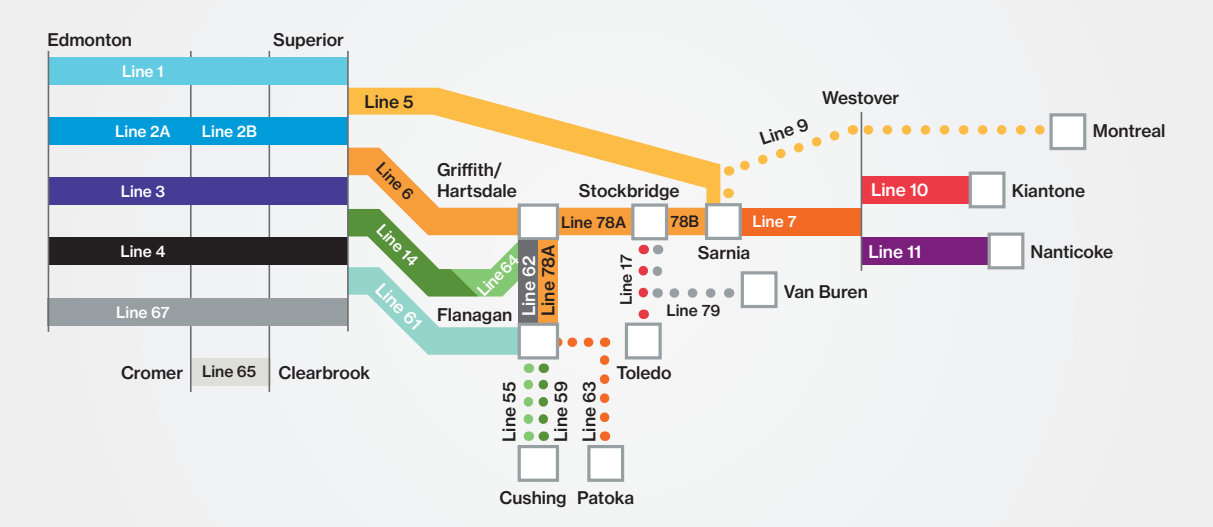
NOTE: Capacities provided are annual capacities and do not include current restrictions.

Pipeline System Configuration

Q1, 2020



Line 1
37,600 m3/d (237 kbpd)
18"/20" – 1,767 km (1,098 mi)
- NGL
- Refined Products
- Light

Line 2A
70,300 m³/d (442 kbpd)
24" – 966 km (600 mi)
- Condensates
- Light

Line 2B
70,300 m³/d (442 kbpd)
24"/26" – 808 km (502 mi)
- Light

Line 3
68,400 m³/d (430 kbpd)
34" – 1,767 km (1,098 mi)
- Light

Line 4
126,500 m³/d (796 kbpd)
36"/48" – 1,770 km (1,100 mi)
- Heavy
- Medium (Ex-Clearbrook)
- Light (Ex-Clearbrook)

Line 5
85,900 m³/d (540 kbpd)
30" – 1,038 km (645 mi)
- NGL
- Light

Line 6
106,000 m³/d (667 kbpd)
34" – 748 km (465 mi)
- Light
- Medium
- Heavy

Line 7
28,600 m³/d (180 kbpd)
20" – 193 km (120 mi)
- Light
- Medium
- Heavy

Line 78A
90,600 m³/d (570 kbpd)
36" – 425 km (264 mi)
- Light
- Medium
- Heavy

Line 78B
79,500 m³/d (500 kbpd)
30"/36" – 175 km (109 mi)
- Light
- Medium
- Heavy

Line 65
29,500 m³/d (186 kbpd)
20" – 504 km (313 mi)
- Light
- Medium

Line 10
11,800 m³/d (74 kbpd)
12"/20" – 143 km (89 mi)
- Light
- Medium
- Heavy

Line 11
18,600 m³/d (117 kbpd)
16"/20" – 76 km (47 mi)
- Light
- Medium
- Heavy

Line 62
37,400 m³/d (235 kbpd)
22" – 121 km (75 mi)
- Heavy

Line 14/64
54,600 m³/d (343 kbpd)
24" – 784 km (487 mi)
- Light
- Medium

Line 61
151,700 m³/d (954 kbpd)
42" – 744 km (462 mi)
- Light
- Medium
- Heavy

Line 67
127,200 m³/d (800 kbpd)
36" – 1,790 km (1,112 mi)
- Heavy

Not part of the Enbridge Mainline System

Line 9
47,700 m³/d (300 kbpd)
30" – 832 km (517 mi)
- Light
- Medium
- Heavy

Line 17
16,000 m³/d (100 kbpd)
16" – 142 km (88 mi)
- Light
- Medium
- Heavy

Line 55
30,700 m³/d (193 kbpd)
22"/24" – 938 km (583 mi)
- Light
- Medium
- Heavy

Line 59
93,000 m³/d (585 kbpd)
36" – 954 km (593 mi)
- Light
- Medium
- Heavy

Line 79
12,700 m³/d (80 kbpd)
20"/16" – 98 km (61 mi)
- Light
- Medium
- Heavy

Line 63
47,700 m³/d (300 kbpd)
24" – 270 km (168 mi)
- Light
- Medium
- Heavy

ENBRIDGE
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NOTE: Capacities provided are Average Annual Capacities and do not include current restrictions.

Attachment D

Bloomberg, *Pipelines Add Room on 'Unrelenting' Demand for Canada's Oil*, Aug. 1, 2019

https://www.bloomberg.com/news/articles/2019-08-01/pipelines-add-room-to-meet-unrelenting-demand-for-canadian-oil

Bloomberg

Pipelines Add Room on 'Unrelenting' Demand for Canada's Oil

By
Robert Tuttle
August 1, 2019, 4:36 PM CDT Updated on August 2, 2019, 10:35 AM CDT

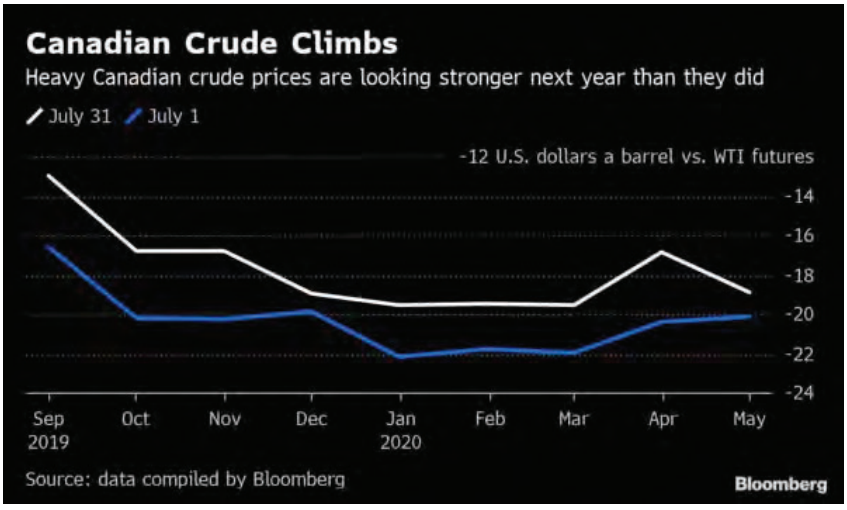
- January Canadian heavy oil discount shrinks $2 in a month
- Enbridge, TC Energy are boosting capacity on export lines

U.S. refiners want more Canadian oil, and pipeline companies are finding ways to get it to them.

Companies are adding space to their congested oil export pipelines from Canada even as plans for bigger expansions and new lines face delays. TC Energy Corp. will offer as much as 50,000 barrels a day of new capacity on its Keystone pipeline as early as next year by using chemicals, called drag resistance agents, to ease flows thorough the system.

That "will allow TC Energy to respond to the demand for additional transportation capacity for crude oil from western Canada to the U.S. Gulf Coast," Jamie Harding, a spokesman for the company, said in an email.

Enbridge Inc., operator of the largest oil pipeline system, is using similar methods to add about 135,000 barrels a day of extra capacity to its system by early next year. The company begins an open season Friday, allowing shippers to sign up for secure, contracted space on the Enbridge mainline system starting in July 2021.



Since June, flows on Enbridge's Mainline are up 213,000 barrels a day from a year earlier, said Tim Pickering, founder and chief investment officer of Auspice Capital Advisors in Calgary. Rail exports are also ramping up and are forecast to reach half a million barrels a day, Tim McKay, present of Canadian Natural Resources Ltd., said Thursday.

"When you put the Enbridge mainline and increased rail, that's whats bringing in differentials" between heavy Canadian crude and WTI futures, Pickering said.

Heavy Canadian crude for January was less than $20 a barrel below to West Texas Intermediate futures Wednesday versus almost $22 a month ago, according to data compiled by Bloomberg.

Enbridge has optimized its pipeline system to create about 220,000 barrels a day of new capacity over the past "couple of years," Jesse Semko, a spokesman for the company, said in an email.

Alberta Curtailment

Canadian oil producers have been struggling to export their crude for more than a year after pipelines filled to capacity, sending the price of heavy Western Canadian Select crude to a $50 discount to futures last October. The situation became dire enough that Alberta's government imposed mandatory limits on the largest suppliers.

Prices are strengthening even after Enbridge announced that its Line 3 pipeline expansion won't start operation until late next year, about 12 months behind schedule, a situation that could prompt an extension of the production limits into 2020. At the same time, new low-sulfur ship fuel rules that go into force next year threaten to cut demand for the heavy, high-sulfur grades of crude produced in Canada.

Still, demand for heavy crude by refiners in the U.S. Gulf Coast and abroad has strengthened as Venezuelan production collapsed amid sanctions and political unrest, OPEC cut output and as sanctions were tightened on Iran. A cargo of Kearl crude was shipped from the Gulf Coast to Malaysia last month, the first such shipment in five years.

"The demand we are seeing from the refiners for heavy barrels is unrelenting," Pickering said. "It's massive."

— *With assistance by Sheela Tobben*

(Adds Enbridge open season in fourth paragraph.)

Attachment E

Enbridge, Public Responses to Honor the Earth Information Requests 14, 15, 16, and 17

Enbridge Energy Response to
Honor the Earth
Information Request

Docket Number:	PL9/CN-14-916	☐ Nonpublic ☒ Public
Requested From:	Enbridge Energy, Limited Partnership James Watts	
Requested By:	Paul Blackburn Attorney for Honor the Earth	Date of Request: 12/20/2019 Response Due: 01/03/2020
Email Address:	paul@honorearth.org	
Phone Number:	612-599-5568	

Request Number:	**14**
Topic:	Update of Mainline System Capacity
References:	Application for a Certificate of Need, pages 14-17; Exhibit EN-15, Neil Earnest Direct Testimony, Schedule 2, pages 62-63

Request:

Please provide:

a. the annual capacity, average annual capacity, design capacity, and ultimate capacity of each existing Mainline System pipeline that crosses the U.S.-Canadian border near Neche, North Dakota, as of the date of this request, as these terms are defined in the Certificate of Need Application, pages 14-17;

b. for each of the pipelines identified in (a) for which the annual capacity, average annual capacity, design capacity, or ultimate capacity changed as compared to the date of the Certificate of Need Application (April 24, 2015), provide a description of the physical, operational, or other modifications that caused such change, including but not limited to:

   i. the date of each modification;

   ii. the capacity in barrels per day resulting from each modification;

   iii. a description of each such physical modification;

   iv. a description of each such operational modification;

   v. a description of any other modification; and

   vi. an estimate of the cost of any modifications;

c. updated figures for Table 8 in Exhibit EN-15, Neil Earnest Direct Testimony, Schedule 2 at 63;

d. for each changed figure provided in response to (c), provide a description of the physical, operational, or other modifications that caused such change, including but not limited to:

   i. the in-service date of each modification;

   ii. the capacity in barrels per day of each modification;

   iii. a description of each physical modification;

   iv. a description of each operational modification;

   v. a description of any other modification; and

   vi. an estimate of the cost of each modification;

e. the effective capacity in barrels per day of the Mainline System as of the date of this request between:

   i. Gretna, Manitoba and Clearbrook, Minnesota, and

   ii. Clearbrook, Minnesota, and Superior, Wisconsin;

   as the term "effective capacity" is defined in Exhibit EN-15, Neil Earnest Direct Testimony, Schedule 2 at 63;

f. the "utilization factor" for the Mainline System as of the date of this request, as the term "utilization factor" is described in Exhibit EN-15, Neil Earnest Direct Testimony, Schedule 2 at 63; and

g. a description of the physical and/or operational modifications that resulted in any increase in effective capacity provided in (e) as compared to the effective capacity figures provided in Exhibit EN-15, Neil Earnest Direct Testimony, Schedule 2 at 63, or that resulted in an increase in the "utilization factor" provided in (f) greater than 92%, such description to include:

   i. the in-service date of each modification; and

   ii. the increase in effective capacity increase provided by each modification.

RESPONSE:

Enbridge Energy, Limited Partnership objects to this Information Request on the grounds that discovery is not currently available under any Minnesota Rules or Statutes or otherwise. Without waiving the foregoing objection, Enbridge provides the following response:

While apportionment of crude oil continues the Enbridge Mainline System, Enbridge has been continuously looking for ways to add incremental capacity to the Mainline System within current regulatory requirements, in order to meet the critical energy supply demands. Enbridge's Responses to HTE's Information Requests explain the specifics of our optimization work. This work did not increase current design capacity but has increased the existing pipeline network's utilization. There remains the need to address the integrity and maintenance concerns on existing Line 3 and restore capacity via the Line 3 Replacement Project to meet long-term energy needs, as further evidenced in the CN proceedings, even with the existing system's additional throughput.

a. All requested capacities for the Enbridge Mainline System crossing the US-Canada border are the same as those already provided on the Pipeline System Configuration Q1 2017 schematic (as included in Schedule 7 of the Glanzer Testimony) and DOC-DER information request #242 responded on June 20, 2017.

b. The above requested capacities have not changed since the date of the Certificate of Need Application. Enbridge has not increased current design capacity but has increased utilization of the existing pipeline network.

c. Please find below the updated Table 8 as per request. Changes are highlighted in red.

SUMMARY OF ENBRIDGE MAINLINE CAPACITY

Thousands of Barrels per Day

	Gretna to Clearbrook						*Clearbrook to Superior*					
	Pre-Project			*Post-Project*			*Pre-Project*			*Post-Project*		
	Light	*Heavy*	*Swing*	*Light*	*Heavy*	*Swing*	*Light*	*Heavy*	*Swing*	*Light*	*Heavy*	*Swing*
Line 1	21	-	-	21	-		21	-	-	21	-	-
Line 2	442	-	-	442	-		442	-	-	442	-	-
Line 3	390	-	40	-	760	760	390	-	40	-	760	760
Line 4	-	796	-	-	796		-	796	-	-	796	-
Line 65	186	-	-	186	-		NA	NA	NA	NA	NA	NA
Line 67	-	800	-	-	800		-	800	-	-	800	-
Subtotal	**1,039**	**1,596**	**40**	**649**	**2,356**	**760**	**853**	**1,596**	**40**	**463**	**2,356**	**760**
w/ Utilization Factor	**1,008**	**1,548**		**630**	**2,285**		**827**	**1,548**		**449**	**2,285**	

d. Line 1 data has been modified to reflect operational changes to the light crude product traveling in this line which is used as buffers for NGL. The batch size of this buffer has increased from 13,000bdp to 21,000bpd to improve efficiency of the line.

e. Please refer to Section (c). Updated Table 8 bottom row.

f. The updated Utilization Factor for the Enbridge Mainline System is 97%.

g. Please refer to Enbridge Response to HTE IR No. 17(a) and (b). In addition to those items, other operational scheduling optimizations and maintenance coordination activities have been conducted. These are ongoing activities and do not have specific in-service dates or effective capacity additions.

Enbridge Energy Response to
Honor the Earth
Information Request

Docket Number:	PL9/CN-14-916	☐ Nonpublic ☒ Public
Requested From:	Enbridge Energy, Limited Partnership James Watts	
Requested By:	Paul Blackburn Attorney for Honor the Earth	Date of Request: 12/20/2019 Response Due: 01/03/2020
Email Address:	paul@honorearth.org	Updated: 01/13/2020
Phone Number:	612-599-5568	

Request Number:	**15**
Topic:	Update of Mainline System Capacity
References:	Statement of Jesse Semko, Enbridge spokesman identified in *Pipelines Add Room on 'Unrelenting' Demand for Canada's Oil*, Bloomberg.com, August 1, 2019 (available at: https://www.bloomberg.com/news/articles/2019-08-01/pipelines-add-room-to-meet-unrelenting-demand-for-canadian-oil

Request:

With regard to the statement by Jesse Semko reported in *Pipelines Add Room on 'Unrelenting' Demand for Canada's Oil*, by reporter Robert Tuttle of Bloomberg.com, on August 1, 2019 (available at: https://www.bloomberg.com/news/articles/2019-08-01/pipelines-add-room-to-meet-unrelenting-demand-for-canadian-oil) "Enbridge has optimized its pipeline system to create about 220,000 barrels a day of new capacity over the past "couple of years," Jesse Semko, a spokesman for the company, said in an email," please provide:

a. confirmation of Mr. Semko's employment at the time of this statement with Enbridge and his job title at that time;

b. a copy of the emails sent by Mr. Semko to Mr. Tuttle that discuss, identify or describe any new capacity created in the past "couple of years;"

c. confirmation that the 220,000 figure provided by Mr. Semko is accurate, or if it is not, the correct figure;

d. a description of each physical or operational modification undertaken by Enbridge to create the total new capacity described by Mr. Semko, as this may be corrected by your response to (b), in each of the years 2017, 2018, and 2019.

Amended Response:

Enbridge Energy, Limited Partnership objects to this Information Request on the grounds that discovery is not currently available under any Minnesota Rules or Statutes or otherwise. Without waiving the foregoing objection, Enbridge provides the following response:

a. Jesse Semko is a Senior Advisor Corporate Communications at Enbridge.

b. Please see Attachment HTE 15B.

c. The 220,000bpd figure reported by Mr. Tuttle is accurate. It references the amount of capacity recovery and optimizations achieved 2016 through 2018. Enbridge has optimized its operation by safely removing bottlenecks allowing the increased utilization of the existing system pipeline capacity.

d. The 220,000bpd is comprised of capacity recoveries for Lines 2B, 65 and 4 and from Mainline System optimizations starting from 2016. System optimization includes activities such as modifying scheduling practices, optimizing maintenance work to minimize down time and lower response times to technical challenges. These are ongoing activities and do not have specific in-service dates or effective capacity additions but are anticipated to increase general utilization of the system capacity.

   These are not increases to current design capacity, but increases in utilization of the existing pipeline network. The 220,000bpd increase is already accounted for in the update utilization factor provided in Enbridge's Response to HTE IR No. Request 14.

From: Jesse Semko
To: Robert Tuttle
Cc: Bloomberg Energy Desk; Tracie Kenyon
Subject: Mainline Volumes
Date: Friday, July 26, 2019 7:19:00 PM

Hi Robert,

Our response is below:

> Over the past couple of years, Enbridge has optimized its system to create approximately 220 kbpd of additional capacity. We've been able to do that through capacity recovery efforts, optimization of maintenance work and increased scheduling efficiencies.

Thank you,
Jesse

Jesse Semko
Sr Advisor Corp Comms & Media Relations
—
ENBRIDGE
TEL: 403-699-1373 | CELL: 587-999-4894 | jesse.semko@enbridge.com
Suite 2900, 425 1st Street SW, Calgary, AB T2P 3L8
enbridge.com
Safety. Integrity. Respect.

From: Robert Tuttle (BLOOMBERG/ NEWSROOM:) <rtuttle@bloomberg.net>
Sent: Friday, July 26, 2019 2:53 PM
To: Jesse Semko <Jesse.Semko@enbridge.com>
Subject: [External] Re:Mainline Volumes

Thats OK just as soon as possible. Thank you, Robert

Oh, can you send your answer also to energynews@bloomberg.net?
Thank you, Robert

From: Jesse.Semko@enbridge.com At: 07/26/19 14:45:20
To: Robert Tuttle (BLOOMBERG/ NEWSROOM:)
Subject: Mainline Volumes

> I'll look into this for you.
>
> I might not get an answer today.

Is that okay?

Jesse Semko
Sr Advisor Corp Comms & Media Relations
—

ENBRIDGE
TEL: 403-699-1373 | CELL: 587-999-4894 | jesse.semko@enbridge.com
Suite 2900, 425 1st Street SW, Calgary, AB T2P 3L8

enbridge.com
Safety. Integrity. Respect.

From: Robert Tuttle (BLOOMBERG/ NEWSROOM:)
Sent: Friday, July 26, 2019 3:22:14 PM (UTC-06:00) Central Time (US & Canada)
To: Media
Subject: [External] Mainline Volumes

Hi Enbridge, I heard today that you are managing to ship 213k b/d more oil through your mainline than a year ago. Is that correct and, if it is, how are you doing it? That sounds like a remarkable boost in capacity. Thank you, Robert Tuttle

---

ROBERT TUTTLE
REPORTER
BLOOMBERG NEWS
110 9 AVE SW
2ND FLOOR, SUITE 200
CALGARY
AB T2P0T1
CANADA
OFFICE +1(587)7023033
CELL +1(403)9996479
RTUTTLE@BLOOMBERG.NET

Enbridge Energy Response to
Honor the Earth
Information Request

Docket Number:	PL9/CN-14-916	☐ Nonpublic ☒ Public
Requested From:	Enbridge Energy, Limited Partnership James Watts	
Requested By:	Paul Blackburn Attorney for Honor the Earth	Date of Request: 12/20/2019 Response Due: 01/03/2020
Email Address:	paul@honorearth.org	
Phone Number:	612-599-5568	

Request Number:	**16**
Topic:	Update of Mainline System Planned Capacity Increases to 2020
References:	Statement of Jesse Semko, Enbridge spokesman identified in *Pipelines Add Room on 'Unrelenting' Demand for Canada's Oil*, Bloomberg.com, August 1, 2019 (available at: https://www.bloomberg.com/news/articles/2019-08-01/pipelines-add-room-to-meet-unrelenting-demand-for-canadian-oil

Request:

With regard to the statement in *Pipelines Add Room on 'Unrelenting' Demand for Canada's Oil*, by reporter Robert Tuttle of Bloomberg.com, on August 1, 2019 (available at: https://www.bloomberg.com/news/articles/2019-08-01/pipelines-add-room-to-meet-unrelenting-demand-for-canadian-oil) "Enbridge Inc., operator of the largest oil pipeline system, is using similar methods to add about 135,000 barrels a day of extra capacity to its system by early next year," please provide:

a. confirmation that the 135,000 bpd figure reported by Mr. Tuttle is accurate, or if it is not, provide the correct figure for planned capacity expansions in each quarter of 2019 and 2020;

b. a description of each physical or operational modification undertaken by Enbridge in 2019 and 2020 to the Mainline System to create the total new capacity planned by "early" 2020 reported by Mr. Tuttle, as this may be corrected by your response to (a).

Response:

Enbridge Energy, Limited Partnership objects to this Information Request on the grounds that discovery is not currently available under any Minnesota Rules or Statutes or otherwise. Without waiving the foregoing objection, Enbridge provides the following response:

a. The 135,000bpd reported by Mr. Tuttle is accurate. Enbridge has optimized its operation by safely removing bottlenecks allowing the increased utilization of the existing capacity, which accurately reflects 135,000bpd to its Mainline System as reported earlier in 2019. Enbridge has since identified further optimization opportunities that it will implement in

2020 to increase throughput up to 150,000bpd (15,000bpd additional to the 135,000bpd reported by Mr. Tuttle).

This additional throughput is not an increase to current design capacity but an increase in utilization of the existing network, and it has become available starting in Q4 2019 and is expected to be in service in Q1 2020.

Please note that the same projects will be discussed in this request as in Enbridge's Response to THE IR No. 17. These are the same projects and not additive to those described in Response to No. 17.

Summary of the additional throughput:

- 2019 Window management: 35,000bpd
- Line 3R in Canada: 40,000bpd
- Line 4 Capacity recovery: 25,000bpd
- 2020 Window management: 50,000bpd

b. The safe removal of the network bottlenecks to increase the utilization of the Mainline System includes:

- Replacing the first capacity constraint for Line 3 by putting Line 3R into service in Canada. Line 3R Canada ties in to existing Line 3 at the US border. L3US will continue to operate consistent with all regulatory requirements including Maximum Allowable Operating Pressure. ISD Q4 2019.
- Enbridge was able to increase Line 4's throughput by transporting heavier molecules, which previously travelled on Line 4 for delivery to Regina, onto lines transporting lighter molecules. This re-allocation eliminated windows at Regina which created a "hole" in the Line 4 batch schedule.
- Optimization of Line 4 window management by moving heavier molecules that previously travelled on Line 4 onto lighter lines (no need for changes to the physical scope). ISD Q4 2019.
- Line 4 capacity recovery by adding new DRA skids, trimming pump impellers and modifying motors at multiple pump stations along Line 4 in Canada and the US. ISD Q4 2019.
- Optimization of Line 1 window management by using Line 3R capacity in Canada to re-inject volumes moving on L3R in Canada into Line 1 at Gretna (new piping and associated facilities are currently under construction at the Gretna Terminal. Expected ISD Q1 2020.

Please refer to Enbridge's Response to HTE IR No. 17 (a) and (b) for additional details.

Enbridge Energy, Limited Partnership Response to
Honor the Earth
Information Request

Docket Number:	PL9/CN-14-916	☐ Nonpublic ☒ Public Document – NONPUBLIC Data has been Excised
Requested From:	Enbridge Energy, Limited Partnership James Watts	
Requested By:	Paul Blackburn Attorney for Honor the Earth	Date of Request: 12/20/2019 Response Due: 01/03/2020
Email Address:	paul@honorearth.org	
Phone Number:	612-599-5568	

Request Number:	**17**
Topic:	Update of Mainline System Capacity Increases in 2019 and Future Years
References:	Enbridge 2019 Annual Investor Day Liquids Pipelines Presentation, December 10, 2019, available at: https://www.enbridge.com/~/media/Enb/Documents/Investor%20Relations/2019/2019_ENB_Day_Liquids_Pipelines_FINAL.pdf

Request:

With regard to the Enbridge 2019 Annual Investor Day Liquids Pipelines Presentation, December 10, 2019, available at: https://www.enbridge.com/~/media/Enb/Documents/Investor%20Relations/2019/2019_ENB_Day_Liquids_Pipelines_FINAL.pdf, please provide:

a. with regard to Slide 15 (attached), a description of each physical or operational modification to each Mainline System pipeline performed by Enbridge in the year 2019 to create a "100 kbpd" increase in the Mainline System capacity, specifying the effect of such increase on the annual capacity, average annual capacity, design capacity, and ultimate capacity of each pipeline, and on the effective capacity of the Mainline System, and for each such modification provide:

   i. the date or date range of each such modification was or will be completed;

   ii. the capacity in barrels per day resulting from each such modification;

   iii. the physical modifications that have been or will be completed that provide a "100 kbpd" capacity increase;

   iv. the operational modifications that have been or will be completed that provide a "100 kbpd" capacity increase; and

   v. an estimate of the cost of any such physical or operational modifications;

b. with regard to Slide 15 (attached), a description of each physical or operational modification to each Mainline System pipeline planned by Enbridge in the year 2020 to create a future "50 kbpd" increase in the Mainline System capacity, specifying the effect of such increase on the annual capacity, average annual capacity, design capacity, and ultimate capacity of each pipeline, and on the effective capacity of the Mainline System, and for each such modification provide:

    i. the planned date or date range of any such modification;

    ii. the expected capacity increase in barrels per day resulting from such modification;

    iii. a description of the physical modifications planned that provide a "50 kbpd" capacity increase;

    iv. a description of the operational modifications planned that provide a "50 kbpd" capacity increase; and

    v. an estimate of the cost of any such planned physical or operational modifications;

c. with regard to Slide 15 (attached), a description of each physical or operational modification planned by Enbridge in the year 2020 to the Express Pipeline to create an increase in capacity, specifying whether the increase is to the annual capacity, average annual capacity, design capacity, and ultimate capacity of the Express Pipeline, and for each such modification provide:

    i. the planned date or date range of work on each such modification;

    ii. the anticipated in-service date of each such modification;

    iii. the capacity in barrels per day resulting from each such modification;

    iv. a description of the physical modifications planned;

    v. a description of the operational modifications planned;

    vi. a description of the development status of each such modification; and

    vii. an estimate of the cost of any physical or operational modifications planned;

d. with regard to Slide 20 (attached), a description of the "Further Mainline Enhancements" that comprise the "~200 kbpd" of additional capacity shown on this slide, specifying the effect of such increase on the annual capacity, average annual capacity, design capacity, and ultimate capacity or each pipeline, and on the effective capacity of the Mainline System, and for each such enhancement provide:

    i. the planned date or date range of any such enhancement;

    ii. the capacity in barrels per day resulting from such enhancement;

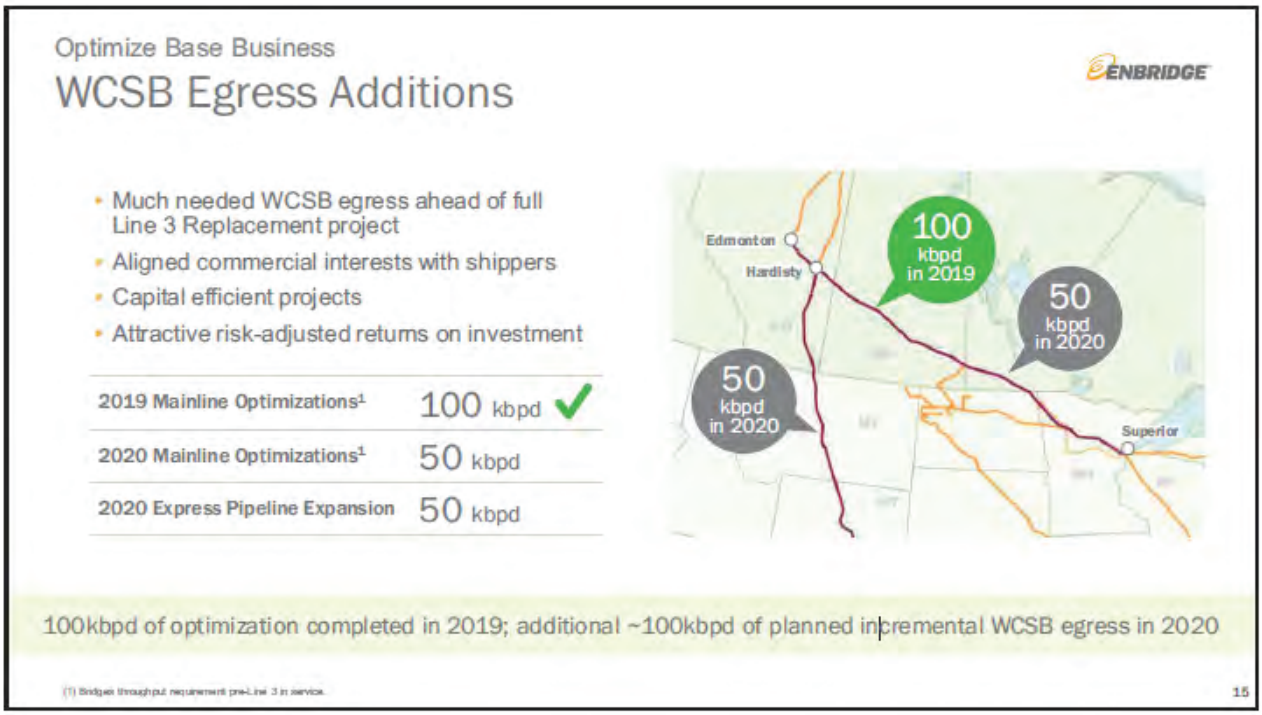
    iii. a description of the physical modifications required for each such enhancement;

    iv. a description of the operational modifications required for each such enhancement;

v. a description of the development status of each such enhancement; and

vi. an estimate of the cost of each such physical or operational enhancement; and

e. with regard to Slide 20 (attached), a description of the "Southern Lights Reversal" project, including the status of any discussions with shippers of diluent on Line 13, co-owners of Line 13, or other interested parties regarding the timing of and contractual modifications required to reverse Line 13 and convert it to use to import crude oil from Canada.



Response:

Enbridge Energy, Limited Partnership objects to this Information Request on the grounds that discovery is not currently available under any Minnesota Rules or Statutes or otherwise. Without waiving the foregoing objection, Enbridge provides the following response:

a. The Enbridge pipeline system in Western Canada is a complex network of pipelines, moving multiple grades of crude oil between numerous receipt and delivery points. Placing the Line 3 Replacement project into service in Canada enhances the options available to optimize scheduling of the crude on the various pipelines to increase overall network utilization.

Please note that the same projects will be discussed in this request as in Enbridge Response to HTE IR No. 16. These are the same projects and not additive to those described in Response No.16.

i. The additional throughput is comprised of 3 components:

- Line 4 Capacity Recovery: October 2019
- Line 3 Replacement Canada: December 2019
- Line 4 Window Management: December 2019

ii. the capacity in barrels per day resulting from each such modification;

Additional throughput breakdown:

- Line 4 Capacity Recovery: 25,000bpd
- Line 3 Replacement Canada: 40,000bpd
- Line 4 Window Management: 35,000bpd

These are not increases to current design capacity, but increases in utilization of the existing pipeline network. The increased efficiency through enhanced window management is expected to increase throughput on the system.

iii. The modifications are comprised of 3 components:

- Line 4 Capacity Recovery: Additional DRA skids, pump impeller trims and motor modifications at various Line 4 pump stations in Canada and US.
- Line 3 Replacement Canada: Completion and commissioning of Line 3 Replacement in Canada and connection to legacy Line 3 at the US border. L3US will continue to operate consistent with all regulatory requirements including Maximum Allowable Operating Pressure. ISD Q4 2019.
- Line 4 Window Management: There was no physical scope associated with this capacity, as it was an operational modification.

iv. The operational modification comprised of 3 components:

- Line 4 Capacity Recovery: N/A
- Line 3 Canada: N/A
- Line 4 Window Management: Enbridge was able to increase throughput on Line 4 by moving heavier molecules that previously travelled on Line 4 for delivery into Regina onto lighter lines. This re-allocation eliminated windows at Regina which created a “hole” in the Line 4 batch schedule.

v. In aggregate the 100kbpd of incremental capacity cost ~$5B CAD, the bulk of which is comprised of the costs associated with the Canadian component of the Line 3 Replacement project.

b.

i. This increased throughput will be available in Q1 2020.

ii. This is not an increase to current design capacity, but an increase in utilization of the existing pipeline network. The increased efficiency is expected to increase throughput on the system by 50,000bpd.

iii. Physical facilities include new piping and associated facilities at Gretna to support injections onto Line 1 to utilize a window downstream of Gretna. Other work includes upgrades to relief facilities and the refurbishment of tankage.

iv. Enbridge will be using Canadian Line 3R capacity upstream of Gretna to move light crude into the Gretna terminal. This crude will then be injected into Line 1, utilizing windows created by the delivery of refined products into Gretna.

v. The cost of this project is expected to be $45MM CAD.

c.

i. Physical work on the Express Expansion occurred through the second half of 2019 and is ongoing in the first half of 2020.

ii. Enbridge is expected to have the Express expansion in-service in Q1 2020.

iii. After acquiring the Express pipeline, Enbridge identified alternatives to increase the annual capacity of this pipeline by 50,000bpd. Enbridge has no further plan at this time, to increase Express pipeline capacity beyond the incremental 50,000 bpd.

iv. Physical modifications include the addition of DRA skids on Express pipeline pump stations, pump impeller trims, as well as the modifications to relief and metering facilities at Hardisty, Buffalo, Edgar and Casper Terminals.

v. There is not expected to be operational modifications made for the Express Expansion.

vi. All development work is completed, and the project is in the execution/construction phase.

vii. The entire project is expected to cost **[NONPUBLIC DATA HAS BEEN EXCISED**].

d.

Enbridge has not commenced detailed development work of these projects, nor has it negotiated commercial support from shippers or sought approval from the Enbridge board to sanction funding.

i. There has been minimal development work completed on these enhancement options and, therefore, a planned ISD is not available. The ultimate need and timing for these enhancements will be driven by various factors such as progress on other third-party pipeline capacity out of the WCSB, production growth from the WCSB and commercial viability of moving forward with these further enhancements.

ii. The capacity could be up to 200,000bpd (annual average), based on limited hydraulic analysis.

iii. Detailed design of these further enhancements has not been completed. Given the complex nature of the mainline system, a variety of options has been identified to create additional capacity. These options include the use of DRA, pump modifications, optimization of heavy/light batch allocations to the various pipelines and batch sequencing, window management and optimization as well as improvements to batch movements through our terminals. Ultimately which option(s) are chosen will be driven by more detailed design and commercial viability.

iv. See Enbridge Response to HTE IR No. 17(d)(iii).

v. See Enbridge Response to HTE IR No. 17(d)(iii).

vi. Preliminary estimates indicate these enhancements could cost up to $1.5B USD.

e.

Enbridge engages in regular conversations with its shippers regarding optimization opportunities on our system and associated commercial arrangements. One such project that could present a future opportunity is the reversal of the Southern Lights pipeline. At this point, those commercial conversations have not resulted in any concrete plans to reverse Southern Lights for delivery of crude from Canada to the United States. One significant consideration is the availability of Canadian domestic condensate to satisfy diluent demand in Western Canada and therefore the requirement for importing of condensate on the Southern Lights pipeline which currently imports condensate from the US. The Southern Lights pipeline currently has long term contracts in place based on the current condensate service. Any conversion and reversal of the pipeline will require agreement of the existing contracted shippers. Those conversations are on-going.

Attachment F

Enbridge, *Prevention of Significant Deterioration Permit Application for the Superior Terminal Enhancements 2020 Project*, submitted to Wisconsin Department of Natural Resources January 17, 2020

Enbridge Energy, Limited Partnership
7701 France Ave S, Suite 600
Edina, MN 55435

www.enbridgeUS.com

ENBRIDGE

January 17, 2020

Wisconsin Department of Natural Resources
Air Program, AM/7
Attn: Construction Permits
P.O. Box 7921
Madison, WI 53707-7921

RE: Enbridge Energy, Limited Partnership – Superior Terminal (FID# 816010580)
Superior Terminal Enhancements 2020 Project

Dear Sir or Madam:

Enbridge Energy, Limited Partnership (Enbridge) has enclosed two copies of an application for a construction permit for our Superior Terminal located in Superior, Wisconsin. The facility is a major source for purposes of Title V and federal prevention of significant deterioration (PSD) permitting program, and is an area source for hazardous air pollutants (HAP). The facility operates under Title V permit number 816010580-P16 issued on November 27, 2017.

The Project Enbridge proposes consists of the following changes that have been conservatively aggregated together, as follows:

1. Increase the projected annual throughput of existing Line 4 to match the maximum design capacity.
2. Increase the projected annual throughput of existing Line 67 to match the maximum design capacity.
3. Increase the projected annual throughput of existing Line 61 to match the maximum design capacity.

The Project will increase the inbound terminal throughput capacity from 3,035,000 to 3,213,400 barrels per day (bpd) and the outbound terminal throughput capacity will increase from 2,880,000 to 3,013,333. As the throughput will still be limited by the outbound capacity, the net effect of the Project on the facility's maximum throughput capacity will be an increase of 133,333 bpd.

The proposed Line 4 throughput increase will not require any physical changes at the Superior Terminal or outside the Superior Terminal.

The proposed Line 67 throughput increase will not require any physical changes at the Superior Terminal or outside the Superior Terminal.

The proposed Line 61 throughput increase will not require physical changes to any piping components, however, it will require the addition of vacuum breakers on 21 existing terminal tanks. The tanks Enbridge proposes to modify are tanks T6, T9, T10, T14, T15, T18, T19, T25, T26, T27, T30, T31, T32, T33, T34, T35, T36, T37, T38, T39, and T40 to add one additional vacuum breaker to accommodate the increased withdrawal rate associated with the Line 61 optimization.

Enbridge estimates the proposed Project's emission increase to conservatively be 130 tons of volatile organic compounds per year (tpy VOC). The Project's emission increase is above the 40 tpy VOC

significant emission rate for ozone as defined at 40 CFR 52.21(b)(23). As a result, Enbridge is submitting this PSD permit application for the proposed project.

The application for the construction permit consists of the above narrative and the following:

1. Permit Application Forms
   a. 4530-100
   b. 4530-101
   c. 4530-102, -102A, -102B
   d. 4530-127
   e. 4530-129
   f. 4530-132
   g. 4530-134
   h. 4530-105
   i. 4530-118
   j. 4530-125
   k. 4530-126
   l. 4530-128

2. Emission Calculation and Supporting Information
   a. Figure 1 – Facility Plot Plan
   b. Figure 2 – Site Location Map
   c. Appendix B – PSD Applicability Emission Calculations
   d. Appendix C – Facility-wide Potential to Emit Calculation Summary Tables
   e. Appendix D – NR445 Compliance Modeling Analysis Report
   f. Appendix E – 2018 Annual Compliance Certification
   g. Appendix F – Actual Emission Calculation Summary Tables
   h. Appendix G – PSD Permit Application BACT Analysis
   i. Appendix H – PSD Permit Application Additional Impact Analysis

3. Check for Fee

If you have any questions or require additional information, please contact me at (612) 248-0498 or christopher.meek@enbridge.com.

Sincerely,

Chris Meek.
Environment Specialist

cc: Tom Peterson – Enbridge
Env. Files – Duluth & Flanagan

Enclosure: Permit Application Forms
Figures 1 – 2
Appendices A – H
Check

Superior Terminal Enhancements 2020 Project

Prevention of Significant Deterioration Permit Application

Enbridge Energy, Limited Partnership
Superior, Wisconsin Terminal

January 2020

4300 MarketPointe Drive
Minneapolis, MN 55435
Phone: (952) 832-2600
Fax: (952) 832-2601

Superior Terminal Enhancements 2020 Project
Prevention of Significant Deterioration
Permit Application

January 2020

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List of Appendices

1.0 Introduction

Enbridge Energy, Limited Partnership – Superior Terminal (referred to herein as "Enbridge") is proposing to increase the permitted pipeline throughput capacity on inbound pipelines Line 4 and Line 67 and outbound pipeline Line 61 and add one additional vacuum breaker on 21 existing storage tanks.

Enbridge submits the enclosed Prevention of Significant Deterioration (PSD) permit application for the Superior Terminal Enhancements 2020 Project (referred to herein as "the Project"). Enbridge is requesting approval to increase the total facility throughput capacity.

1.1 Source Description

Enbridge operates a crude oil storage terminal located at 2800 East 21st Street, Superior, Wisconsin that consists of forty-five storage tanks of varying capacity and design (referred to as T01 through T45 on the Facility Plot Plan and Site Location Map in Appendix A). Enbridge utilizes the tanks as breakout storage for crude oil arriving into the Superior Terminal from inbound pipelines prior to flow volume metering and reinjection back into the outbound pipelines for continued transportation via its pipeline system to refineries and other market hubs.

The Superior Terminal also operates a 84.4 MMBtu-per-hour process heater used to heat crude oil to decrease viscosity and decrease the amount of energy required to pump the oil on Line 6A, one diesel fire pump, eight emergency generators, pig receiver/launchers, sump tanks, pumps, and piping components such as valves and flanges.

The Superior Terminal is classified as code 486110 in the North American Industry Classification System (NAICS) for pipeline transportation of crude oil or as code 4612 in the U.S. Standard Industrial Classification (SIC) system.

1.2 Operating Permit Source Status

The Superior Terminal is currently a Part 70 (major) source which operates under operation permit number 816010580-P16. The existing terminal is a major stationary source for Title V permitting and PSD purposes and is an area (minor) source for hazardous air pollutants (HAPs).

Douglas County is designated attainment or unclassifiable for the National Ambient Air Quality Standards for all criteria pollutants [carbon monoxide (CO), lead, nitrogen oxides (NO_X), ozone,

particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), particulate matter less than 10 microns in diameter (PM_{10}), and sulfur dioxide (SO_2)].

1.3 Description of Proposed Project

The Project involves several individual elements described below.

1.3.1 Terminal Throughput Capacity Increase

The Project proposes to increase the potential inbound terminal throughput capacity from 3,035,000 to 3,213,400 bpd as a result of a change in the methodology used to represent the potential throughput capacities of existing Line 4 and Line 67. The Project also proposes to increase the terminal outbound throughput capacity from 2,880,000 to 3,013,333 bpd. The increase will not require physical changes such as piping or other equipment modifications. The proposed capacity increase is as a result of a change in methodology used to represent the potential throughput capacity of existing Line 61 up to its design capacity. The terminal throughput capacity is bottlenecked by the outbound pipeline capacity, which will be 3,013,333 bbl/day after the Project. The Project will result in a 133,333 bpd increase in terminal throughput capacity.

1.3.1.1 Line 4 Throughput Capacity

The throughput for Line 4 is currently represented at an annual average pipeline capacity of 796,000 bpd. Enbridge has identified optimizations and efficiencies on Line 4 such that it is potentially capable of operating above the current annual average pipeline capacity. The current permitted annual average pipeline capacity is 90% of the maximum constructed design capacity. Through this Project, Enbridge proposes to increase the throughput representation for Line 4 at the as-constructed maximum designed capacity of 884,500 bpd to account for this operational optimization. The proposed throughout capacity increase is simply a change in the maximum potential throughput capacity for Line 4, the increase will not require physical changes such as piping or other equipment modifications at the Superior Terminal and will not require modifications to Line 4 outside of the Superior Terminal.

1.3.1.2 Line 67 Throughput Capacity

The throughput for Line 67 is currently represented at an annual average pipeline capacity of 800,000 bpd. Enbridge has identified optimizations and efficiencies on Line 67 such that it is potentially capable of operating above the current annual average pipeline capacity. Through this Project, Enbridge proposes to increase the throughput representation for Line 67 at the as-constructed maximum designed capacity of 889,900 bpd to account for this operational optimization. The

proposed throughout capacity increase is simply a change in the maximum potential throughput capacity for Line 67, the increase will not require physical changes such as piping or other equipment modifications at the Superior Terminal and will not require modifications to Line 67 outside of the Superior Terminal.

1.3.1.3 Line 61 Throughput Capacity

The throughput for Line 61 is currently represented at an annual average pipeline capacity of 1,200,000 bpd. Enbridge has identified optimizations and efficiencies on Line 61 such that it is potentially capable of operating above the current annual average pipeline capacity. Through this Project, Enbridge proposes to increase the throughput representation for Line 61 at the as-constructed maximum designed capacity of 1,333,333 bpd to account for this operational optimization. The proposed throughout capacity increase is simply operating Line 61 up to its design capacity, the increase will not require physical changes such as piping or pump modifications at the Superior Terminal. The throughput capacity increase will not require modifications to Line 61 outside of the Superior Terminal.

1.3.2 Existing Storage Tank Vacuum Breaker Modifications

The Line 61 throughput capacity and withdrawal rate increase from the terminal storage tanks requires modification of existing storage tanks T06, T09, T10, T14, T15, T18, T19, T25, T26, T27, T30, T31, T32, T33, T34, T35, T36, T37, T38, T39 and T40 to add one additional vacuum breaker on each of the tanks. The modified storage tanks will have an existing access hatch retrofitted with a vacuum breaker. Enbridge is proposing to add the additional vacuum breakers in order to meet American Petroleum Institute (API) tank venting standards for atmospheric storage tanks. The additional vacuum breakers will allow for increased venting capacity when the storage tank floating roof is landed on its roof legs and the vacuum breakers are activated allowing vacuum relief.

1.3.3 Project Emissions

Enbridge estimates the proposed Projects' emission increase to conservatively be 130 tons per year (tpy) (refer to the emissions summary calculations in Appendix B). The proposed project emission increase is above the 40 tpy volatile organic compounds (VOC) significant emission rate for ozone as defined at 40 CFR 52.21(b) 23 and s. NR 405.02 (27)(a). As a result, Enbridge is submitting this PSD permit application for the proposed project.

The proposed increased pipeline throughput capacity and tank modifications will result in additional methane emissions (considered a greenhouse gas (GHG)). The proposed Project will also result in an

estimated 2,395 tpy increase in terminal GHG emissions (calculated as CO_2 equivalents or CO_2e). Refer to Appendix B, Table 1-5 for a summary of the Project GHG emissions. The proposed Project will not debottleneck, modify or affect existing terminal combustion sources.

1.3.4 Modified Tank NSPS Kb Applicability Analysis

Under the Standards of Performance for New Stationary Sources regulations per 40 CFR Part 60 Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (NSPS Kb), storage tanks with a capacity of greater than or equal to 75 cubic meters (19,813 gallons) are affected facilities if they are constructed, modified or reconstructed after July 23, 1984. To accommodate the Line 61 throughput capacity increase, Enbridge proposes to construct one additional vacuum breaker on each of the following tanks: T06, T09, T10, T14, T15, T18, T19, T25, T26, T27, T30, T31, T32, T33, T34, T35, T36, T37, T38, T39 and T40. Table 1 below summarizes the pre and post project NSPS Kb applicability status of the tanks modified as part of the Project and the proposed vacuum breaker deck fitting modifications.

Table 1 – Modified Tank NSPS Kb Applicability Status and Deck Fitting Modifications

Tank Number and Type	Pre-Project NSPS Kb Applicability Status	Post-Project Emissions Increase (kg/hr)	Post-Project NSPS Kb Applicability Status	Deck Fitting Modifications
T06 EFRT	Grandfathered - Not Subject to NSPS Kb	(0.18)	Grandfathered - Not Subject to NSPS Kb	Add 1 Vacuum breaker, NSPS Kb emission controls
T09 EFRT	NSPS Kb	0.67	NSPS Kb	Add 1 Vacuum breaker
T10 EFRT	Grandfathered - Not Subject to NSPS Kb	(0.20)	Grandfathered - Not Subject to NSPS Kb	Add 1 Vacuum breaker, NSPS Kb emission controls
T14 EFRT	Grandfathered - Not Subject to NSPS Kb	0.56	NSPS Kb	Add 1 Vacuum breaker, NSPS Kb emission controls
T15 EFRT	Grandfathered - Not Subject to NSPS Kb	0.56	NSPS Kb	Add 1 Vacuum breaker, NSPS Kb emission controls
T18 EFRT	Grandfathered - Not Subject to NSPS Kb	0.56	NSPS Kb	Add 1 Vacuum breaker, NSPS Kb emission controls
T19 EFRT	Grandfathered - Not Subject to NSPS Kb	0.08	NSPS Kb	Add 1 Vacuum breaker, NSPS Kb emission controls
T25 EFRT	NSPS Kb	0.56	NSPS Kb	Add 1 Vacuum breaker
T26 DEFRT	NSPS Kb	0.55	NSPS Kb	Add 1 Vacuum breaker
T27 EFRT	NSPS Kb	0.56	NSPS Kb	Add 1 Vacuum breaker
T30 EFRT	NSPS Kb	0.50	NSPS Kb	Add 1 Vacuum breaker
T31 EFRT	NSPS Kb	0.50	NSPS Kb	Add 1 Vacuum breaker
T32 EFRT	NSPS Kb	0.57	NSPS Kb	Add 1 Vacuum breaker
T33 EFRT	NSPS Kb	0.57	NSPS Kb	Add 1 Vacuum breaker
T34 EFRT	NSPS Kb	0.45	NSPS Kb	Add 1 Vacuum breaker
T35 EFRT	NSPS Kb	0.56	NSPS Kb	Add 1 Vacuum breaker
T36 EFRT	NSPS Kb	0.56	NSPS Kb	Add 1 Vacuum breaker
T37 EFRT	NSPS Kb	0.56	NSPS Kb	Add 1 Vacuum breaker
T38 EFRT	NSPS Kb	0.56	NSPS Kb	Add 1 Vacuum breaker
T39 EFRT	NSPS Kb	0.56	NSPS Kb	Add 1 Vacuum breaker
T40 EFRT	NSPS Kb	0.56	NSPS Kb	Add 1 Vacuum breaker

Detailed NSPS applicability analysis calculations showing the pre and post project potential hourly emission rates are provided in Table 1-6 in Appendix C. The addition of a vacuum breaker results in the storage tanks being physically modified and subject to Best Available Control Technology (BACT) review as part of the PSD review process. It was determined through the BACT review (refer to the Appendix G) that the external floating roof tanks (EFRT) and domed external floating roof tank (DEFRT) would not be required to add any additional deck fitting emission controls beyond what is required to meet NSPS Kb requirements.

Modified tanks T14, T15, T18 and T19 which will become affected facilities under the NSPS Kb regulations will be required to meet the emission control requirements specified in the regulation. The NSPS applicability analysis for Tanks T06 and T10 determined that the deck fitting controls required to meet BACT (which is NSPS Kb controls) will results in a net pre-to-post project emission reduction and as a result, the tanks will not become an affected facility under the NSPS regulations.

1.0 Emission Calculation Discussion

Air emissions from the terminal consist primarily of the following VOC emissions:

- Storage tank operations,
- Piping components (i.e., valves, flanges, pump seals)

Refer to the facility-wide potential to emit calculations in Appendix C for additional detail regarding emissions.

1.1.1 Storage Tank Emissions

Storage tank emissions occur from:

- Standing losses (rim seal losses, deck fitting losses, and deck seam losses),
- Withdrawal losses,
- Floating roof landing losses, and
- Tank cleaning losses.

Storage tank emissions resulting from standing, withdrawal losses and internal and external floating roof landing loss emission values are calculated using the methodology described in the EPA AP-42, Chapter 7.1, *Organic Liquid Storage Tanks* guidance document (EPA, Compilation of Air Pollutant Emission Factors, Volume 1, 5th edition, November 2006).

The storage tanks also generate emissions from tank cleaning events. This process occurs when Enbridge removes a tank from service to allow personnel entry to conduct an inspection and/or complete repairs within the tank. Enbridge must also inspect tanks externally (e.g. from the roof) on a routine basis. Cleaning loss emissions are calculated using the methodology described in American Petroleum Institute (API) Technical Report 2568, *Evaporative Loss from the Cleaning of Storage Tanks*, November 2007. Refer to the tank cleaning loss emissions in Table 2-4B of the facility-wide potential to emit calculations in Appendix C.

Through pipeline hydraulic modeling, Enbridge has determined that crude oil received into storage tanks will be at elevated temperatures due to frictional heating and as a result terminal tanks will be operated above ambient temperatures. To account for the elevated tank operating temperatures in the emission calculations, the monthly tank operating temperatures for all storage tanks have been adjusted to reflect a representative worst case (highest temperature) for crude oil which could be stored in tankage at the Superior Terminal. Storage tank emissions have conservatively been

estimated based on the physical properties (vapor pressure and density) of the Light Sour Blend (LSB) crude type which is representative of the worst case (highest vapor pressure) materials stored at the Superior Terminal.

In addition to calculating storage tank emissions based on elevated operating temperatures, Enbridge has used the average monthly wind speed data used in the tank calculations based on US National Weather Service wind speed data for Superior, Wisconsin.

1.1.2 Fugitive Piping Emissions

Fugitive emissions from piping components are calculated using marketing terminal average emission factors from the *Protocol for Equipment Leak Emission Estimates* (EPA Office of Air Quality Planning and Standards, November 1995, EPA-453/R-95-017). All piping components are assumed to be in light liquid VOC service and operate 8,760 hours per year. Refer to the piping component fugitive emission calculations in Table 2-5 of the facility-wide potential to emit calculations in Appendix C.

1.1.3 Hazardous Air Pollutant Emissions

Hazardous air pollutant (HAP) emissions are calculated based on crude oil chemical speciation data from the EPA's TANKS program crude oil chemical speciation profile and EPA EPCRA Section 313 industry guidance document for petroleum terminal and bulk storage facilities. Individual HAP speciation profiles are used to calculate the vapor weight fraction using the methodology described in the *API Manual of Petroleum Measurement Standards Chapter 19.4 - Evaporative Loss Reference Information and Speciation Methodology*, Third Edition, October 2012. If the two HAP speciation data sources contained different speciation data for the same chemical, the higher of the two liquid or vapor weight fractions. HAP emissions are calculated by multiplying the total VOC emissions for an emission unit by the HAP liquid or vapor weight fraction depending on the emission type. HAP emissions from withdrawal losses are calculated by multiplying the withdrawal loss VOC emissions and the individual HAP liquid weigh fraction. HAP emissions from all other tank emissions and other emission units are calculated by multiplying the VOC emissions and the vapor weight fraction of the individual HAP compounds.

1.1.4 NR 445 Air Quality Impact Analysis

The terminal is subject to WDNR hazardous air contaminant (HAC) regulations per s. NR 445. Benzene is the only HAC emitted at the terminal that exceeds NR445 emissions thresholds. Enbridge completed an air quality impacts analysis to demonstrate that HAC emissions from the

Terminal comply with WDNR NR445 Control of Hazardous Pollutant regulations (refer to the NR445 Compliance Modeling Summary and summary calculations in Appendix D).

1.1.5 Terminal Throughput Capacity

Appendix B, Table 1-4 summarizes the maximum daily terminal inbound and outbound pipeline capacities on a maximum annual pipeline design capacity basis. Prior to the Project, the outbound pipeline capacity of 2,880,000 bpd limited the terminal throughput capacity. After the Project, the terminal's inbound throughput capacity will increase to 3,213,400 bpd. The outbound pipeline capacity will increase to 3,013,333 bpd and as a result, the terminal throughput will remain outbound limited. The Project related throughput increase will be equal to 133,333 bpd (increase from 2,880,000 bpd to 3,013,333 bpd).

Typically, operators calculate the throughput for an individual tank based on its capacity as a fraction of the total terminal. This would result in approximately 97 turnovers per tank per year for each of the 45 tanks. However, to be consistent with previous permit applications, Enbridge calculated emissions for tanks subject to existing and proposed PSD Best Available Control Technology (BACT) limits (Tanks T6, T09, T10, T14, T15, T18, T19, T25, T26, T27 and T30 through T45) based on 200 turnovers per tank per year and the remaining tanks based on 87 turnovers per tank per year, which is the estimated future potential throughput of the tanks. This method results in combined tank throughput which exceeds the terminal's maximum throughput by approximately 39.7% or 1,987,820 bpd and results in an over-estimation of potential emissions from the storage tanks.

The number of turnovers is not an individual tank turnover or throughput limit. Enbridge used this throughput to estimate annual average withdrawal losses for the terminal's storage tanks. Some tanks will have a higher number of actual turnovers and others will have lower. Refer to the Project emissions calculations in Appendix B and the facility-wide emission calculations in Appendix C.

2.0 General Facility Permit Application Forms

State of Wisconsin
Department of Natural Resources
dnr.wi.gov

Facility Details and Permit Actions
Air Pollution Control Permit Application

Form 4530-100 (R 02/19)

Notice: Use of this form is required by the Department for any air pollution control permit application filed pursuant to ss. 285.61, 285.62 or 285.66, Wis. Stats. Completion of this form is mandatory. The Department will not consider or act upon your application unless you complete and submit this application form. You are required to submit two copies in accordance with s. NR 407.05(2), Wis. Adm. Code. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

Facility Information

1. Facility Name	2. SIC and NAICS	3. Facility ID Number (FID)
Enbridge Energy, Limited Partnership - Superior Terminal	4612/486110	816010580
4. Street Address (where pollution sources are/will be located)	**5.** ◉ City ○ Town ○ Village	**6. County**
2800 East 21st Street	of Superior	Douglas

7. Primary Operating Activity (e.g., lead-acid battery manufacturer or sulfite paper mill)

Pipeline transportation of crude oil

8. Is the facility located in an area designated as "nonattainment"? (refer to instructions)	9. If yes, indicate the pollutant(s) for the nonattainment designation
○ Yes ◉ No	

Applicant Information

10. Responsible Official Name (person legally responsible for the operation of the permitted air pollution sources [see NR 400.02(80e), Wis. Adm. Code])

Trent Wetmore

11. Title	12. Email	12A. Phone Number	
Director, Midwest Region	trent.wetmore@enbridge.com	(715) 398-4593	
13. Mailing Address	**City**	**State**	**ZIP Code**
119 North 25th Street East	Superior	WI	54880

14. Parent Corporation or Owner Name (if not wholly owned by applicant)

Enbridge Energy, Limited Partnership

15. Mailing Address	City	State	ZIP Code	Country (if not U.S.)
7701 France Ave S., Suite 600	Edina	MN	55435	

16. Permit Contact Person – to be contacted for additional information concerning air pollution sources	17. Email
Chris Meek	christopher.meek@enbridge.com
18. Title	**19. Phone Number**
Environmental Sr Advisor	(612) 248-0498

Permit Information

20. Construction Permit Actions:

Instructions: If applying for a construction permit action (including modification, reconstruction, relocation, replacement, and revision), you MUST also apply for an operation permit option. A check for the construction permit application fees MUST be submitted with the application forms before the department will begin their review. Application fees are listed below in section A. Additional fees may be required and a final invoice will be sent when a final permit decision is made. See ch. NR 410 for current fee amounts and additional review fees.

A. Permit Actions:
- ◉ New Construction/Modification ($7,500) – Anticipated start dates: 10/01/2020 (Construction) 12/01/2020 (Operation)
- ○ Construction Permit Revision ($1,500 fee)

List Permit(s) to be revised: _____

☒ **Requesting Expedited Review** – If expedited review of construction permit is requested and fulfilled within expected time periods, the construction permit review fee—invoiced with the final permit—will include a surcharge from $4000 to $7500 depending on the type and how fast the permit is issued. See ch. NR 410 for specific expedited fees.

B. Construction Permit Exemptions (indicate one): If you are requesting a review and response to an exemption, a check must be included for the appropriate exemption fee listed below in parentheses.
- ○ Actual Emissions-Based Exemption (for construction project only) ($1,250)
- ○ Research & Testing ($1,250)
- ○ Modification for source with Plant-wide Applicability Limit ($1,500 / $2,400 with modeling)
- ○ Significant Net Emissions Increase ($5,500 / $6,500 with modeling)
- ○ General exemption ($500 - NR 406.04(2))
- ○ Specific exemptions ($500) – **Select appropriate code citation(s) from list:** _____
- ○ Other: _____

For more information on exemption citations: https://docs.legis.wisconsin.gov/code/admin_code/nr/400/406.pdf

C. Operation Permit type for Construction Action **(select one)**:
- ○ Original – if you currently do not have a facility-wide operation permit
- ◉ Revision – so that your facility-wide operation permit will be revised to reflect the proposed project
- ○ Renewal – if you are renewing your facility-wide operation permit in conjunction with the proposed project

State of Wisconsin
Department of Natural Resources
dnr.wi.gov

Facility Details and Permit Actions
Air Pollution Control Permit Application

Form 4530-100 (R 02/19)

Notice: Use of this form is required by the Department for any air pollution control permit application filed pursuant to ss. 285.61, 285.62 or 285.66, Wis. Stats. Completion of this form is mandatory. The Department will not consider or act upon your application unless you complete and submit this application form. You are required to submit two copies in accordance with s. NR 407.05(2), Wis. Adm. Code. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

Facility Information

1. Facility Name	2. SIC and NAICS	3. Facility ID Number (FID)
Enbridge Energy, Limited Partnership - Superior Terminal	4612/486110	816010580

4. Street Address (where pollution sources are/will be located)	5. ◉ City ○ Town ○ Village	6. County
2800 East 21st Street	of Superior	Douglas

7. Primary Operating Activity (e.g., lead-acid battery manufacturer or sulfite paper mill)

Pipeline transportation of crude oil

8. Is the facility located in an area designated as "nonattainment"? (refer to instructions) ○ Yes ◉ No	9. If yes, indicate the pollutant(s) for the nonattainment designation

Applicant Information

10. Responsible Official Name (person legally responsible for the operation of the permitted air pollution sources [see NR 400.02(80e), Wis. Adm. Code])

Trent Wetmore

11. Title	12. Email	12A. Phone Number
Director, Midwest Region	trent.wetmore@enbridge.com	(715) 398-4593

13. Mailing Address	City	State	ZIP Code
119 North 25th Street East	Superior	WI	54880

14. Parent Corporation or Owner Name (if not wholly owned by applicant)

Enbridge Energy, Limited Partnership

15. Mailing Address	City	State	ZIP Code	Country (if not U.S.)
11 East Superior Street, Suite 125	Duluth	MN	55802	

16. Pe... additional information concerning air pollution sources

Ch... REFER TO PREVIOUS PAGE FOR CORRECT APPLICANT MAILING ADDRESS (EDINA)

17. Email
christopher.meek@enbridge.com

18. Tit...
En...

19. Phone Number
(612) 248-0498

Permi...

20. C... In... M... fo... in... ...permit action (including modification, reconstruction, relocation, replacement, and revision), you ...otion. A check for the construction permit application fees MUST be submitted with the application ...r review. Application fees are listed below in section A. Additional fees may be required and a final ...ision is made. See ch. NR 410 for current fee amounts and additional review fees.

A. Permit Actions: ◉ New Construction/Modification ($7,500) – Anticipated start dates: 10/01/2020 (Construction) 12/01/2020 (Operation)

○ Construction Permit Revision ($1,500 fee)

List Permit(s) to be revised: _____

☒ **Requesting Expedited Review** – If expedited review of construction permit is requested and fulfilled within expected time periods, the construction permit review fee—invoiced with the final permit—will include a surcharge from $4000 to $7500 depending on the type and how fast the permit is issued. See ch. NR 410 for specific expedited fees.

B. Construction Permit Exemptions (indicate one): If you are requesting a review and response to an exemption, a check must be included for the appropriate exemption fee listed below in parentheses.

○ Actual Emissions-Based Exemption (for construction project only) ($1,250)
○ Research & Testing ($1,250)
○ Modification for source with Plant-wide Applicability Limit ($1,500 / $2,400 with modeling)
○ Significant Net Emissions Increase ($5,500 / $6,500 with modeling)
○ General exemption ($500 - NR 406.04(2))
○ Specific exemptions ($500) – **Select appropriate code citation(s) from list:** _____
○ Other: _____

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For more information on exemption citations: https://docs.legis.wisconsin.gov/code/admin_code/nr/400/406.pdf

C. Operation Permit type for Construction Action **(select one)**:

○ Original – if you currently do not have a facility-wide operation permit
◉ Revision – so that your facility-wide operation permit will be revised to reflect the proposed project
○ Renewal – if you are renewing your facility-wide operation permit in conjunction with the proposed project

21. Operation Permit Actions:

A. Type of Operation Permit Requested **(select one)**:

- (●) Part 70 Source
- ( ) Synthetic Minor, Non - Part 70 Source
- ( ) Non - Part 70 Source
- ( ) Elective

NOTE: Facilities that do not have a facility-wide operation permit issued MUST select the appropriate option. All other requests should indicate type of permit, to reflect continued or changing status.

B. Renewal

- ( ) Operation Permit Renewal

NOTE: For more information, see website on streamlined renewal application options.

C. Operation Permit Revision: (select one revision type – check code for criteria)

- ( ) Administrative Revision (NR 407.11)
- ( ) Minor Revision (NR 407.12)
- (●) Significant Revision (NR 407.13)

List Permit(s) to be revised:
816010580-P16

D. Operation Permit Exemption Options: (select one type for entire facility)

- ( ) Actual Emissions Based Exemption (NR 407.03(1m))
- ( ) Natural Minor Source Exemption (NR 407.03(1s))

IMPORTANT: The exemption options in Section D. require revocation of existing operation and/or construction permits. Certain construction permit conditions cannot be revoked, and therefore the department would be unable to revoke the permits. Review all existing permits for case-by-case determinations, especially NR 405/NR 408, and discuss with department staff whether conditions are revocable.

E. Other Operation Permit Exemption Options:

- ( ) General exemptions – NR 407.03(2)
- ( ) Specific categories – Must be only air pollution source at entire facility

Select appropriate code citation(s) from list: _____

22. For All Permit Actions:

Is additional information attached? (●) Yes ( ) No

Submit two paper copies of completed form(s), with ink signature on this form, and additional information to:

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
BUREAU OF AIR MANAGEMENT
P.O. BOX 7921
MADISON, WI 53707-7921

OR Email an electronic copy to DNRAMAirPermit@wisconsin.gov and mail one complete paper copy with ink signature to the address above.

23. Signature of Responsible Official

A. Statement of Completeness:

I have reviewed this application in its entirety and, based on information and belief formed after reasonable inquiry, I certify that the statements and information contained in this application are true, accurate and complete.

B. Certification of Facility Compliance Status: (select one box only) **This is not a requirement of Non-Part 70 Sources.**

(●) I certify that the facility described in this air pollution permit application is fully in compliance with all applicable requirements.

( ) I certify that the facility described in this air pollution permit application is fully in compliance with all applicable requirements, except for the following emissions unit(s) (list all non-complying units): _____

Signature of Responsible Official

1/17/2020
Date Signed

State of Wisconsin
Department of Natural Resources

FACILITY PLOT PLAN
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-101 Rev. 12-99

Use of this form is required by the Department for any air pollution control permit application filed pursuant to ss. 285.61, 285.62 or 285.66, Wis Stats. Completion of this form is mandatory. The Department will not consider or act upon your application unless you complete and submit this form. It is not the Department's intention to use any personally identifiable information from this form for any other purpose.

In order for a comprehensive air quality analysis to be accomplished, a facility plot plan MUST be included with the permit application. If the application is for an initial operation permit, submit the elements under #2 below. If the application is for a renewal, answer #1 below first.

1. Have there been changes to the facility plot plan since the previous operation permit application was submitted?
   - ☐ No. The plot plan submitted with the original application can be used for the renewal.
   - ☒ Yes. An up-to-date plot plan is attached. **Note: See Figures 1 and 2 in Appendix A**

2. If there have been changes to the facility plot plan since the last operation permit application submittal, RESUBMIT an up-to-date plot plan which must include the following or the permit application will be deemed incomplete:

FOR DEPARTMENT USE ONLY

COMPLETE	INCOMPLETE	NOT APPLICABLE	
			1. A building layout (blueprint, plan view) including all buildings occupied by or located on the site of the facility.
			2. The maximum height of each building (excluding stack height).
			3. The location and numerical designation of each stack. Please ensure these designations correspond to the appropriate stacks listed on the other permit forms in this application.
			4. The location of fenced property lines (if any).
			5. Identify direction "North" on all submittals.
			6. All drawings shall be to scale and shall have the scale graphically depicted.
			7. An additional regional map depicting the facility location in relation to the surrounding vicinity (roads or other features) shall be included.

Are there any outdoor storage piles on the facility site? ☒ Yes ☐ No

If so, what material does the pile(s) consist of? **Temporary contaminated soil storage piles**

Are there any dirt roads or unpaved parking lots on the facility site? ☒ Yes ☐ No

Note: Traffic on unpaved areas at the terminal consists of mowers and maintenance vehicles in the tank farm area. Emissions from paved and unpaved areas at the terminal are considered insignificant.

State of Wisconsin
Department of Natural Resources

SOURCE AND SITE DESCRIPTIONS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-102 Rev. 12-99 Information attached? N (y/n)

Use of this form is required by the Department for any air pollution control permit application filed pursuant to ss. 285.61, 285.62 or 285.66, Wis Stats. Completion of this form is mandatory. The Department will not consider or act upon your application unless you complete and submit this form. It is not the Department's intention to use any personally identifiable information from this form for any other purpose.

1. Briefly describe the proposed Project or existing Unit(s) to be permitted. Attached supplemental forms as needed.

Terminal Throughput Capacity Increase

The Project proposes to increase the potential inbound terminal throughput capacity from 3,035,000 to 3,213,400 bpd as a result of a change in the methodology used to represent the potential throughput capacities of existing Line 4 and Line 67. The Project also proposes to increase the terminal outbound throughput capacity from 2,880,000 to 3,013,333 bpd. The increase will not require physical changes such as piping or pump equipment modifications. The proposed capacity increase is as a result of a change in methodology used to represent the potential throughput capacity of existing Line 61 up to its design capacity. The terminal throughput capacity is bottlenecked by the outbound pipeline capacity, which will be 3,013,333 bbl/day after the Project. The Project will result in a 133,333 bpd increase in terminal throughput capacity.

Existing Storage Tank Vacuum Breaker Modifications

The Line 61 throughput capacity and withdrawal rate increase from the terminal storage tanks requires modification of existing storage tanks T06, T09, T10, T14, T15, T18, T19, T25, T26, T27, T30, T31, T32, T33, T34, T35, T36, T37, T38, T39 and T40to add one additional vacuum breaker on each of the tanks. The modified storage tanks will have an existing access hatch retrofitted with a vacuum breaker. Enbridge is proposing to add the additional vacuum breakers in order to meet American Petroleum Institute (API) tank venting standards for atmospheric storage tanks. The additional vacuum breakers will allow for increased venting capacity when the storage tank floating roof is landed on its roof legs and the vacuum breakers are activated allowing vacuum relief.

The proposed tank modifications and increase in potential throughput will result in tanks T14, T15, T18 and T19 becoming affected facilities under the 40 CFR 60 Subpart Kb regulations.

For Renewal Applications: **Not applicable**

1. Were any new or modified emissions units installed/modified at the facility since the last operation permit issuance date?
   - ☐ No. Proceed to form 4530-102A.
   - ☐ Yes. Answer the following questions:

2. Briefly describe any new/modified emissions units installed at the facility since the last operation permit issuance date and include the following information. Attach supplemental forms as needed.
   Not applicable

2. Site Description

The Enbridge Superior terminal is located on 179 acres at the intersection of Bardon Avenue and 21st Street in Superior, Wisconsin. The terminal consists of 45 existing and permitted storage tanks which are operated as crude oil pipeline breakout tanks.

State of Wisconsin
Department of Natural Resources

SOURCE DESCRIPTION - SUPPLEMENTAL
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-102A Rev. 12-99 Information attached? N (y/n)

Use of this form is required by the Department for any air pollution control permit application filed pursuant to ss. 285.61, 285.62 or 285.66, Wis Stats. Completion of this form is mandatory. The Department will not consider or act upon your application unless you complete and submit this form. It is not the Department's intention to use any personally identifiable information from this form for any other purpose.

1. List all significant existing or proposed air pollution units, operations, and activities at the facility. A short narrative of the inventory of air pollution emissions unit (e.g., boiler, printing line, etc.) followed by equipment specifications will suffice. If the facility consists of several individual emission units, present this information in an outline format. (See instruction booklet for an example Unit description.)

Existing Emission Units

Process Tank T01, External floating roof tank, 16,380,000 gallon capacity
Process Tank T02, External floating roof tank, 16,380,000 gallon capacity
Process Tank T03, Domed external floating roof tank, 6,300,000 gallon capacity
Process Tank T04, Domed external floating roof tank, 6,300,000 gallon capacity
Process Tank T05, External floating roof tank, 6,300,000 gallon capacity
Process Tank T06, External floating roof tank, 6,300,000 gallon capacity – To be modified
Process Tank T07, External floating roof tank, 6,300,000 gallon capacity
Process Tank T08, External floating roof tank, 6,300,000 gallon capacity
Process Tank T09, External floating roof tank, 6,300,000 gallon capacity – To be modified
Process Tank T10, External floating roof tank, 6,300,000 gallon capacity – To be modified
Process Tank T11, External floating roof tank, 6,300,000 gallon capacity
Process Tank T12, External floating roof tank, 6,300,000 gallon capacity
Process Tank T13, External floating roof tank, 9,114,000 gallon capacity
Process Tank T14, External floating roof tank, 9,114,000 gallon capacity – To be modified triggering NSPS Kb
Process Tank T15, External floating roof tank, 9,114,000 gallon capacity – To be modified triggering NSPS Kb
Process Tank T16, External floating roof tank, 9,114,000 gallon capacity
Process Tank T17, External floating roof tank, 9,114,000 gallon capacity
Process Tank T18, External floating roof tank, 9,114,000 gallon capacity – To be modified triggering NSPS Kb
Process Tank T19, External floating roof tank, 9,114,000 gallon capacity – To be modified triggering NSPS Kb
Process Tank T20, External floating roof tank, 9,114,000 gallon capacity
Process Tank T21, External floating roof tank, 9,114,000 gallon capacity
Process Tank T22, External floating roof tank, 9,114,000 gallon capacity
Process Tank T23, External floating roof tank, 9,114,000 gallon capacity
Process Tank T24, External floating roof tank, 9,114,000 gallon capacity
Process Tank T25, External floating roof tank, 9,114,000 gallon capacity – To be modified
Process Tank T26, Domed external floating roof tank, 9,114,000 gallon capacity – To be modified
Process Tank T27, External floating roof tank, 9,114,000 gallon capacity – To be modified
Process Tank T28, Internal floating roof tank, 9,114,000 gallon capacity
Process Tank T29, Internal floating roof tank, 9,114,000 gallon capacity
Process Tank T30, External floating roof tank, 10,500,000 gallon capacity – To be modified
Process Tank T31, External floating roof tank, 10,500,000 gallon capacity – To be modified
Process Tank T32, External floating roof tank, 7,680,000 gallon capacity – To be modified
Process Tank T33, External floating roof tank, 7,680,000 gallon capacity– To be modified
Process Tank T34, External floating roof tank, 16,471,098 gallon capacity – To be modified
Process Tank T35, External floating roof tank, 8,673,426 gallon capacity – To be modified
Process Tank T36, External floating roof tank, 8,673,426 gallon capacity – To be modified
Process Tank T37, External floating roof tank, 8,673,426 gallon capacity – To be modified
Process Tank T38, External floating roof tank, 8,673,426 gallon capacity – To be modified
Process Tank T39, External floating roof tank, 8,673,426 gallon capacity – To be modified
Process Tank T40, External floating roof tank, 8,673,426 gallon capacity – To be modified
Process Tank T41, External floating roof tank, 24,537,744 gallon capacity
Process Tank T42, External floating roof tank, 24,537,744 gallon capacity
Process Tank T43, External floating roof tank, 24,537,744 gallon capacity
Process Tank T44, External floating roof tank, 24,537,744 gallon capacity
Process Tank T45, External floating roof tank, 24,537,744 gallon capacity

Process H01 Crude Oil Heater, S01, 84.4 MMBtu natural gas heater
Process EG1, EG2, EG3, EG4, EG5, EG6, EG7, EG8, EG9 – Diesel Engine Emergency Generators
Process EN3 – Diesel Engine Water Pump
Process F01, Stack S02 – Piping Component/Pumping Fugitive
Process ST01- ST03: Process (sump) Tanks
Process PG01- PG03: Pigging Equipment/ Operations
Process FT1 – Diesel Engine Emergency Generator Fuel Tank
Process FT2 – Diesel Engine Emergency Generator Fuel Tank

For Renewal Applications: **Not applicable**

1. If there were any new or modified emissions units installed/modified at the facility since the last operation permit issuance date:
    a. If any of these new/modified units were exempt from construction permit requirements, but are significant emissions units and operation permit application(s) for the new unit(s) were submitted to the Department reference the date of those submittals.
    b. If any of the new/modified units are insignificant emissions units list them on form 4530-102B.
    c. If any of the new/modified emissions units do not fit any of the above categories, fill out the appropriate forms for each emissions unit as follows:
        i. For Part 70 Sources: Fill out the appropriate forms 4530-103 through 4530-133; OR
        ii. For Synthetic Minor Non Part-70 Sources and Non-Part 70 Sources: Fill out the appropriate forms 4530-103 through 4530-117 and 4530-126 through 4530-129.

State of Wisconsin
Department of Natural Resources

SOURCE DESCRIPTION - SUPPLEMENTAL
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-102B Rev. 12-99 Information attached? _N_ (y/n)

Use of this form is required by the Department for any air pollution control permit application filed pursuant to ss. 285.61, 285.62 or 285.66, Wis Stats. Completion of this form is mandatory. The Department will not consider or act upon your application unless you complete and submit this form. It is not the Department's intention to use any personally identifiable information from this form for any other purpose.

1. Mark all insignificant existing or proposed air pollution units, operations, and activities at the facility listed below. If not listed, provide a short narrative of the inventory of air pollution emissions unit (e.g., boiler, printing line, etc.) followed by equipment specifications. If the facility consists of several individual emission units, present this information in an outline format. **For Renewal Applications, identify those that are new since the last update to your application.** (See instruction booklet for an example Unit description.)

☒ Maintenance of grounds, equipment, and buildings (lawn care, painting, etc.)
☒ Maintenance activities (including lawn care, pest control, grinding. cutting, brazing, soldering, welding, sand blasting, painting, fiber glassing, woodworking, general repairs and cleaning, etc)
☒ Boiler, turbine, and HVAC system maintenance
☒ Fire control equipment
☒ Janitorial activities
☒ Office activities
☒ Convenience water heating
☒ Convenience space heating (< 5 million BTU/hr Burning Gas, Liquid, or Wood)
☒ Fuel oil storage tanks (< 10,000 gal.)
☒ Stockpiled contaminated soils
☒ Purging of natural gas lines
☒ Sanitary sewer and plumbing venting
☒ Parts cleaner
☒ Electric incinerating toilet
☒ Chemical laboratory
☒ Pipeline and storage tank hydrostatic test water discharge
☒ Pipeline pigging equipment (prior to 2007)
☒ Pipeline pig cleaning facility with oil water separator
☒ Sump tanks (prior to 2007)
☒ Pipeline pressure relief surge tank systems
☒ Pipeline drag reducing agent (DRA) totes
☒ Mobile natural gas liquid flare
☒ Internal combustion engines used for warehousing and material transport from cars, trucks, forklifts, courier vehicles, front loaders, graders, cranes, carts, hydrostatic and hydraulic testing equipment, maintenance trucks, helicopters, portable generators (engine driven) (that are moveable by hand), portable pumps, portable air compressors, portable welding machines (engine driven), and portable fuel tanks
☒ Fugitive emissions from paved and unpaved roads
☒ Vacuum tanker truck emissions
☒ Solid waste disposal containers
☒ Barbecue grills

State of Wisconsin
Department of Natural Resources

FACILITY EMISSIONS SUMMARY
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-129 11-93 Information attached? Y (y/n)

SEE INSTRUCTIONS ON REVERSE SIDE

1. Facility name: Enbridge Energy, Limited Partnership | 2. Facility identification number: **816010580**

3. Complete the following emissions summary for the listed emissions at this facility.
See emission calculations located in Appendix C and F.

Air pollutant	Actual	Maximum theoretical emissions	Potential to emit	Maximum allowable
	TPY	TPY	TPY	TPY
Particulates	**See the facility-wide emission PTE calculation summary tables located in Appendix C and the 2018 actual Emissions summary table in Appendix F.**			
Sulfur dioxide	**See the facility-wide emission PTE calculation summary tables located in Appendix C and the 2018 actual Emissions summary table in Appendix F.**			
Organic compounds	**See the facility-wide emission PTE calculation summary tables located in Appendix C and the 2018 actual Emissions summary table in Appendix F.**			
Carbon monoxide	**See the facility-wide emission PTE calculation summary tables located in Appendix C and the 2018 actual Emissions summary table in Appendix F.**			
Lead	**See the facility-wide emission PTE calculation summary tables located in Appendix C and the 2018 actual Emissions summary table in Appendix F.**			
Nitrogen oxides	**See the facility-wide emission PTE calculation summary tables located in Appendix C and the 2018 actual Emissions summary table in Appendix F.**			
Total reduced sulfur				
Mercury	**See the facility-wide emission PTE calculation summary tables located in Appendix C and the 2018 actual Emissions summary table in Appendix F.**			
Asbestos				
Beryllium				
Vinyl chloride				

State of Wisconsin
Department of Natural Resources

SEE INSTRUCTIONS ON REVERSE SIDE

CURRENT EMISSIONS REQUIREMENTS AND STATUS OF FACILITY
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-132 11-93 Information attached? Y (y/n)

1. Facility name: **Enbridge Energy, Limited Partnership** | 2. Facility identification number: **816010580**

3. Pollutant	4. Wis. Adm. Code Wis. Stats., 40 CFR	5. State Only	6. Threshold Value	7. Compliance Status (in or out)
Refer to the 2018 Annual Compliance Certification in Appendix E for a list of emission requirements and compliance status of the terminal.			Various	In
Refer to the 2018 Annual Compliance Certification in Appendix E for a list of emission requirements and compliance status of the terminal.		*	Various	In

8. Is this facility subject to the provisions governing prevention of accidental releases of hazardous air contaminants contained in section 112(r)(7) of the Clean Air Act?

☐ Yes ☒ No

If you answered yes, please describe how you will achieve compliance with these provisions, including the requirement to formulate a plan for preventing accidental releases (sec. 112(r)(7)(B)(ii)):

9. Other requirements (e.g., malfunction reporting, special operating conditions from an existing permit, etc.)	State Only	Compliance Status (in or out)
Refer to the 2018 Annual Compliance Certification in Appendix E for a list of emission requirements and compliance status of the terminal.		In
Refer to the 2018 Annual Compliance Certification in Appendix E for a list of emission requirements and compliance status of the terminal.	*	In

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INDEX OF AIR POLLUTION PERMIT APPLICATION FORMS
Form 4530-134 Rev. 12-99

I.ADMINISTRATION		
This application contains the following forms:	☒Form 4530-100, Facility Identification	
	☒Form 4530-101, Facility Plot Plan	
	☒Forms 4530-102, -102A, and -102B, Source and Site Descriptions	
II. EMISSIONS SOURCE DESCRIPTION		Total Number of This Form
This application contains the following forms (one form for each facility boiler, printing operation, etc.):	☐Form 4530-103, Stack Identification	
	☐Form 4530-104, Boiler or Furnace Operation	
	☒Form 4530-105, Storage Tanks	**21**
	☐Form 4530-106, Incineration	
	☐Form 4530-107, Printing Operations	
	☐Form 4530-108, Painting and Coating Operations	
	☐Form 4530-109, Miscellaneous Processes	
III.AIR POLLUTION CONTROL SYSTEM		Total Number of This Form
This application contains the following forms:	☐Form 4530-110, Miscellaneous	
	☐Form 4530-111, Condensers	
	☐Form 4530-112, Adsorbers	
	☐Form 4530-113, Catalytic or Thermal Oxidation	
	☐Form 4530-114, Cyclones/Settling Chambers	
	☐Form 4530-115, Electrostatic Precipitators	
	☐Form 4530-116, Wet Collection Systems	
	☐Form 4530-117, Baghouses/Fabric Filters	
IV.COMPLIANCE DEMONSTRATION		Total Number of This Form
This application contains the following forms (one for each facility boiler, printing operation, etc.):	☒Form 4530-118, Compliance Certification - Monitoring and Reporting	**1**
	☐Form 4530-119, Continuous Emission Monitoring	
	☐Form 4530-120, Periodic Emission Monitoring Using Portable Monitors	
	☐Form 4530-121, Control System Parameters or Operation Parameters of a Process	
	☐Form 4530-122, Monitoring Maintenance Procedures	
	☐Form 4530-123, Stack Testing	
	☐Form 4530-124, Fuel Sampling and Analysis	
	☒Form 4530-125, Recordkeeping	**1**

V.EMISSION SUMMARY AND COMPLIANCE CERTIFICATION		Total Number of This Form
This application contains the following forms quantifying emissions, certifying compliance with applicable requirements, and developing a compliance plan	☒Form 4530-126, Emission Unit Hazardous Air Pollutant Summary	1
	☒Form 4530-127, Facility Hazardous Air Pollutant Summary	1
	☒Form 4530-128, Emission Unit Summary	1
	☒Form 4530-129, Facility Emissions Summary	1
	☒Form 4530-130, Current Emissions Requirements and Status of Unit	1
	☐Form 4530-131, Emission Unit Compliance Plan - Commitments and Schedule	
	☒Form 4530-132, Current Emissions Requirements and Status of Facility	1
	☐Form 4530-133, Facility Requirement Compliance Plan Commitments and Schedule	

VI.SIGNATURE OF RESPONSIBLE OFFICIAL

A.STATEMENT OF COMPLETENESS

I have reviewed this application in its entirety and, based on information and belief formed after reasonable inquiry, I certify that the statements and information contained in this application are true, accurate and complete.

B.FOR RENEWALS ONLY

I have reviewed this application, the original operation permit application dated _____, and operation permit number _____ in their entirety and, based on information and belief formed after reasonable inquiry, I certify that the statements and information contained in this renewal application are true, accurate and complete.

C.CERTIFICATION OF FACILITY COMPLIANCE STATUS (check one box only)

THIS IS NOT A REQUIREMENT OF NON-PART 70 SOURCES.

☒ I certify that the facility described in this air pollution permit application is fully in compliance with all applicable requirements.

☐ I certify that the facility described in this air pollution permit application is fully in compliance with all applicable requirements, except for the following emissions unit(s):

(list all non-complying units)

Printed or Typed Name	Title
Trent Wetmore	**Director, Midwest Region**
Signature	Date Signed 1/17/2020

SEND ALL MATERIALS TO:
WISCONSIN DEPARTMENT OF NATURAL RESOURCES
BUREAU OF AIR MANAGEMENT
OPERATION PERMIT TEAM LEADER
P.O. BOX 7921
MADISON, WI 53707-7921

3.0 Permit Application Forms for Modified Tanks

Forms are included for the proposed tank modification to tanks T6, T09, T10, T14, T15, T18, T19, T25, T26, T27, T30-T40.

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

SEE ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T06**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **6,300,000 gallons**

6.Date of Installation or Last Modification **1951 - Proposed Modification in 2020**

7.Tank Height 48 feet

8.Tank Diameter 150 feet

9.Color of Tank (check one)
_X_ White ___Other __ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_ Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_ No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:
a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_1_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
____Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
____ Unbolted cover, gasketed
___ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_4_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_4_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
___1_ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_1_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_____Adjustable, pontoon area , sock
Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
_24__ Adjustable, pontoon area
_ 36 Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity N/A (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,260,000,000	4,725,000 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,554 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? X Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership**

2.Facility Identification Number: **816010580**

3.Storage Tank Number **T09**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **6,300,000 gallons**

6.Date of Installation or Last Modification **1951 – Reconstructed 2011 - Proposed Modification in 2020**

7.Tank Height 48 feet

8.Tank Diameter 150 feet

9.Color of Tank (check one)
__X__ White ___Other __ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
__X__Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes __X__No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
__X__External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): __ Cone Roof - Indicate tank roof height _____(feet)
(required if vertical was selected) _ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
__X__Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): __X__ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: __8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
__X__ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): __X__ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
__4_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
____Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
____ Unbolted cover, gasketed
___ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
__4_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
__4__Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
___1_ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
__1_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_____Adjustable, pontoon area , sock
Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
__24__ Adjustable, pontoon area
_ 36 Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity N/A (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,260,000,000	4,725,000 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,554 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? X Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T10**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **6,300,000 gallons**

6.Date of Installation or Last Modification **1951 - Proposed Modification in 2020**

7.Tank Height 48 feet

8.Tank Diameter 150 feet

9.Color of Tank (check one)
_X_ White ___Other __ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): __ Cone Roof - Indicate tank roof height _____(feet)
(required if vertical was selected) _ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_2_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
____Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
____ Unbolted cover, gasketed
___ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_4_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_4_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
___1_ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_1_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_____Adjustable, pontoon area , sock
Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
_24__ Adjustable, pontoon area
_ 36 Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity _____N/A_____ (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,260,000,000	4,725,000 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
__55,554__ (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? __X__ Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

SEE ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T14**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **9,114,000 gallons**

6.Date of Installation or Last Modification **1952 - Proposed Modification in 2020**

7.Tank Height 48 feet

8.Tank Diameter 180 feet

9.Color of Tank (check one)
_X_ White ___Other __ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank __Fixed Roof ___Fixed Roof w/Internal Floating Roof __ Other (specify)
__ Pressurized Tank _X_External Floating Roof __ Variable Vapor Space _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): __ Cone Roof - Indicate tank roof height _____(feet)
(required if vertical was selected) _ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:
a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary __ Vapor Mounted Primary __ Liquid Mounted Primary
_X_ Shoe Primary, Rim Secondary __ Vapor Primary, Rim Secondary __ Liquid Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary __ Vapor Primary w/Weather Shield __ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_4_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
____Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
____ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_4_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_4_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_1_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
___Adjustable, pontoon area , sock
___ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
_30___ Adjustable, pontoon area
_59 __ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity N/A (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,822,800,000	6,835,500 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,554 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? X Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

SEE ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T15**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **9,114,000 gallons**

6.Date of Installation or Last Modification **1952 - Proposed Modification in 2020**

7.Tank Height 48 feet

8.Tank Diameter 180 feet

9.Color of Tank (check one)
_X_ White ___Other __ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:
a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_4_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
____Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
____ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_4_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_4_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_1_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
___Adjustable, pontoon area , sock
___ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
_30_ Adjustable, pontoon area
_59_ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity ____N/A_____ (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,822,800,000	6,835,500 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,554 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? __X__Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? _N_ (y/n)

ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T18**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **9,114,000 gallons**

6.Date of Installation or Last Modification **1952 - Proposed Modification in 2020**

7.Tank Height 48 feet

8.Tank Diameter 180 feet

9.Color of Tank (check one)
_X_ White ___Other __ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank __Fixed Roof ___Fixed Roof w/Internal Floating Roof __ Other (specify)
__ Pressurized Tank _X_External Floating Roof __ Variable Vapor Space _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): __ Cone Roof - Indicate tank roof height _____(feet)
(required if vertical was selected) _ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary __ Vapor Mounted Primary __ Liquid Mounted Primary
_X_ Shoe Primary, Rim Secondary __ Vapor Primary, Rim Secondary __ Liquid Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary __ Vapor Primary w/Weather Shield __ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_4_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
____Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
____ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_4_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_4_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_1_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
____Adjustable, pontoon area , sock
____ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
_30_ Adjustable, pontoon area
_59_ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity N/A (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,822,800,000	6,835,500 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,556 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? X Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership**

2.Facility Identification Number: **816010580**

3.Storage Tank Number **T19**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **9,114,000 gallons**

6.Date of Installation or Last Modification **1952 - Proposed Modification in 2020**

7.Tank Height
48 feet

8.Tank Diameter
180 feet

9.Color of Tank (check one)
_X_ White ___Other __ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): __ Cone Roof - Indicate tank roof height _____(feet)
(required if vertical was selected) _ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_7_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
_1_Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
____ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_4_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_4_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
_1__ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_1_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
____Adjustable, pontoon area , sock
____ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
_17___ Adjustable, pontoon area
_64___ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity ____N/A_____ (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,822,800,000	6,835,500 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
__55,556__ (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? __X__ Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

E ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T25**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **9,114,000 gallons**

6.Date of Installation or Last Modification **1990 - Proposed Modification in 2020**

7.Tank Height 48 feet

8.Tank Diameter 180 feet

9.Color of Tank (check one)
_X_ White ___Other __ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_5_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
____Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
____ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_4_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_5_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
_1_ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_2_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
____Adjustable, pontoon area , sock
____ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
_28___ Adjustable, pontoon area
_52___ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity ____N/A_____ (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,822,800,000	6,835,500 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,556 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? __X__ Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T26**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **9,114,000 gallons**

6.Date of Installation or Last Modification **1994 - Proposed Modification in 2020**

7.Tank Height 48 feet

8.Tank Diameter 180 feet

9.Color of Tank (check one)
_X_ White ___Other __ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
___External Floating Roof
__X__Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): ___ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: ___ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
___ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): ___ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
___ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
____Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
____ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_5_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
___Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_2__Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_____Adjustable, pontoon area , sock
_____ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
____ Adjustable, pontoon area
___ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____N/A_____

c.Effective Column Diameter: ___ N/A _____ (feet)

d.Deck Type (check one): ___X__ Welded _____ Bolted

e.Total Deck Seam Length: ____N/A Welded_____ (feet)

f.Deck Area: ____ N/A Welded _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
__4__ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
___75_ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
__4__ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity _____N/A_____ (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,822,800,000	6,835,500 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
__55,556__(bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? __X__Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

SEE ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T27**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **9,114,000 gallons**

6.Date of Installation or Last Modification **1995 - Proposed Modification in 2020**

7.Tank Height
48 feet

8.Tank Diameter
180 feet

9.Color of Tank (check one)
_X_ White ___Other __ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_ No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_4_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
____Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
____ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_5_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_6_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
_1_ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_2_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_____Adjustable, pontoon area , sock
____ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
_24___ Adjustable, pontoon area
_72___ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity N/A (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,822,800,000	6,835,500 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,556 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? X Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

SEE ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T30**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **10,500,000 gallons**

6.Date of Installation or Last Modification **1998 - Proposed Modification in 2020**

7.Tank Height 48 feet

8.Tank Diameter 200 feet

9.Color of Tank (check one)
_X_ White ___Other __ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_7_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
____Gasketed sliding cover

Gauge-float well (20" diameter)
____ Unbolted cover, ungasketed
_1_ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_5_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_7_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_2_ Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
____Adjustable, pontoon area , sock
__ _ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
_35_ Adjustable, pontoon area
_57_ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity N/A (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	2,100,000,000	7,875,000 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,556 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? X Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

SEE ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T31**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **10,500,000 gallons**

6.Date of Installation or Last Modification **1998 - Proposed Modification in 2020**

7.Tank Height 48 feet

8.Tank Diameter 200 feet

9.Color of Tank (check one)
_X_ White ___Other __ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:
a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_7_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
____Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
____ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_5_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_5_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
_1__ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_2__Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_____Adjustable, pontoon area , sock
_____ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
_36__ Adjustable, pontoon area
_57__ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity N/A (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	2,100,000,000	7,875,000 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,556 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? X Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T32**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **7,680,000 gallons**

6.Date of Installation or Last Modification **2003 - Proposed Modification in 2020**

7.Tank Height 48.5 feet

8.Tank Diameter 165 feet

9.Color of Tank (check one)
_X_ White ___Other _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
__7_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
__1__Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
____ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
__5_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
____Weighted mechanical actuation, gasketed
__4__ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
__1__ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_2__Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_____Adjustable, pontoon area , sock
____ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
__28__ Adjustable, pontoon area
__89__ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity N/A (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,536,000,000	5,760,000 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,556 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? X Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

E ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T33**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **7,680,000 gallons**

6.Date of Installation or Last Modification **2003 - Proposed Modification in 2020**

7.Tank Height 48.5 feet

8.Tank Diameter 165 feet

9.Color of Tank (check one)
_X_ White ___Other__ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_7_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
_1_Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
_1_ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_5_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
____Weighted mechanical actuation, gasketed
_4_ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_2_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_____Adjustable, pontoon area , sock
____ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
_28_ Adjustable, pontoon area
_89_ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity ____N/A_____ (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,536,000,000	5,760,000 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
__55,556__ (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? __X__ Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T34**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **16,471,098 gallons**

6.Date of Installation or Last Modification **2007- Proposed Modification in 2020**

7.Tank Height 55.5 feet

8.Tank Diameter 224 feet

9.Color of Tank (check one)
_X_ White ___Other__ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank __Fixed Roof ___Fixed Roof w/Internal Floating Roof __ Other (specify)
__ Pressurized Tank _X_External Floating Roof __ Variable Vapor Space _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): __ Cone Roof - Indicate tank roof height _____(feet)
(required if vertical was selected) _ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary __ Vapor Mounted Primary __ Liquid Mounted Primary
_X_ Shoe Primary, Rim Secondary __ Vapor Primary, Rim Secondary __ Liquid Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary __ Vapor Primary w/Weather Shield __ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_2_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
____Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
___ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_9_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
____Weighted mechanical actuation, gasketed
_4_ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_3_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_____Adjustable, pontoon area , sock
____ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
_40_ Adjustable, pontoon area
_88_ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity N/A (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	3,294,219,600	12,353,324 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,556 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? X Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T35**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **8,673,426 gallons**

6.Date of Installation or Last Modification **2008 - Proposed Modification in 2020**

7.Tank Height 55.75 feet

8.Tank Diameter 180 feet

9.Color of Tank (check one)
_X_ White ___Other__ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
__2_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
__1__Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
___ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
__9_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
____Weighted mechanical actuation, gasketed
__4__ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
__2_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_____Adjustable, pontoon area , sock
____ Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
__32__ Adjustable, pontoon area
__60__ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity ____N/A_____ (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,734,685,200	6,505,070 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
__55,556__(bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? __X__Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

SEE ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T36**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **8,673,426 gallons**

6.Date of Installation or Last Modification **2011 - Proposed Modification in 2020**

7.Tank Height 55.75 feet

8.Tank Diameter 180 feet

9.Color of Tank (check one)
_X_ White ___Other__ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank __Fixed Roof ___Fixed Roof w/Internal Floating Roof __ Other (specify)
__ Pressurized Tank _X_External Floating Roof __ Variable Vapor Space _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): __ Cone Roof - Indicate tank roof height _____(feet)
(required if vertical was selected) _ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:
a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary __ Vapor Mounted Primary __ Liquid Mounted Primary
_X_ Shoe Primary, Rim Secondary __ Vapor Primary, Rim Secondary __ Liquid Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary __ Vapor Primary w/Weather Shield __ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
__4_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
__1__Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
___ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
__9_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
__5__Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
__1_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
__32___Adjustable, pontoon area, sock
_ 60 Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
____ Adjustable, pontoon area
_ __ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity N/A (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,734,685,200	6,505,070 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,556 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? X Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T37**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **8,673,426 gallons**

6.Date of Installation or Last Modification **2010 - Proposed Modification in 2020**

7.Tank Height 55.75 feet

8.Tank Diameter 180 feet

9.Color of Tank (check one)
_X_ White ___Other__ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
_Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_4_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
_1_Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
___ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_9_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_5_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_1_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_32___Adjustable, pontoon area, sock
_ 60 Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
____ Adjustable, pontoon area
_ _ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity ____N/A_____ (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,734,685,200	6,505,070 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,556 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? __X__Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T38**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **8,673,426 gallons**

6.Date of Installation or Last Modification **2010 - Proposed Modification in 2020**

7.Tank Height 55.75 feet

8.Tank Diameter 180 feet

9.Color of Tank (check one)
__X__ White ___Other__ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
__X__Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes __X__No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
__X__External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
__X__Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): __X__ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: __8.23__ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
__X__ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): __X__ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
__4__ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
__1__Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
___ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
__9__ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
__5__Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
__1_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
__32___Adjustable, pontoon area, sock
_ 60 Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
____ Adjustable, pontoon area
_ __Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity N/A (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,734,685,200	6,505,070 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,556 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? X Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

SEE ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T39**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **8,673,426 gallons**

6.Date of Installation or Last Modification **2011 - Proposed Modification in 2020**

7.Tank Height 55.75 feet

8.Tank Diameter 180 feet

9.Color of Tank (check one)
_X_ White ___Other__ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): __ Cone Roof - Indicate tank roof height _____(feet)
(required if vertical was selected) _ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_4_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
_1_Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
___ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_9_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_5_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_1_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_32___Adjustable, pontoon area, sock
_ 60 Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
____ Adjustable, pontoon area
_ _ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity _____N/A_____ (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,734,685,200	6,505,070 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,556 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? __X__Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

State of Wisconsin
Department of Natural Resources

STORAGE TANKS
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-105 11-93 Information attached? N (y/n)

SEE ATTACHED SHEET FOR INSTRUCTIONS

1.Facility Name : **Enbridge Energy, Limited Partnership** 2.Facility Identification Number: **816010580** 3.Storage Tank Number **T40**

4.Control Device Number (use number from appropriate Form(s) 4530-110, 111, 112, 113, 114, 115, 116, or 117) **Not applicable**

5.Storage Tank Capacity **8,673,426 gallons**

6.Date of Installation or Last Modification **2011 - Proposed Modification in 2020**

7.Tank Height 55.75 feet

8.Tank Diameter 180 feet

9.Color of Tank (check one)
_X_ White ___Other__ _____ __ Underground

10.Is this tank equipped with a submerged fill pipe?
_X_Yes __ No

11.Is this tank equipped with a pressure/vacuum conservation vent?
__ Yes _X_No
If yes; at what pressure is it set? _____(psia)
at what vacuum is it set? _____(psia)

12.Type of Storage Tank (check one)
__ Open Top Tank
__ Pressurized Tank
__Fixed Roof
_X_External Floating Roof
___Fixed Roof w/Internal Floating Roof
__ Variable Vapor Space
__ Other (specify) _____

13.For all Fixed Roof Tanks:

a.Tank Configuration (check one): __ Vertical (upright cylinder) ___Horizontal

b.Tank Roof Type (check one): (required if vertical was selected)
__ Cone Roof - Indicate tank roof height _____(feet)
_ Dome Roof - Indicate tank roof height _____(feet) - Indicate tank shell radius _____(feet)

14.For all Floating Roof Tanks (both internal and external) - Shell Condition (check one):
_X_Light Rust __ Dense Rust __Gunite Lined

15.For External Floating Roof Tanks:

a.Tank Construction (check one): _X_ Welded Tank __ Riveted Tank

b.Average Wind Speed at Tank Site: _8.23_ (mph)

c.Rim Seal System Description (check one):
__ Shoe Mounted Primary
_X_ Shoe Primary, Rim Secondary
__ Shoe Primary, Shoe Secondary
__ Vapor Mounted Primary
__ Vapor Primary, Rim Secondary
__ Vapor Primary w/Weather Shield
__ Liquid Mounted Primary
__ Liquid Primary, Rim Secondary
__ Liquid Primary w/Weather Shield

d.Roof Type (check one): _X_ Pontoon Roof __ Double Deck Roof

e.Roof Fitting Types (indicate the number of each type):

Access Hatches (3 are 24" diameter and 3 are 3'x 4')
_4_ Bolted cover, gasketed
____ Unbolted cover, ungasketed
____ Unbolted cover, gasketed

Unslotted guide-pole well (8" diameter unslotted pole, 21" diameter well)
____ Ungasketed sliding cover
_1_Gasketed sliding cover

Gauge-float well (20" diameter)
___ Unbolted cover, ungasketed
___ Unbolted cover, gasketed
____ Bolted cover, gasketed

Gauge-Hatch/sample well (8" diameter)
_9_ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Vacuum Breaker (12" diameter well)
_5_Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

Roof Drain (3-inch diameter)
____ Open
____ 90% closed

Slotted guide-pole/sample well (8" diameter diameter slotted pole, 21" diameter well)
____ Ungasketed sliding cover, without float
____ Ungasketed sliding cover, with float
____ Gasketed sliding cover, without float
____ Gasketed sliding cover, with float
___ Gasketed sliding cover, with float, sleeve and wiper,
_1_Gasketed sliding cover, sleeve and wiper, without float,

Roof leg (3" diameter)
_32___Adjustable, pontoon area, sock
_ 60 Adjustable, center area, sock
____ Adjustable, double-deck roofs
____ Fixed

Roof leg(2-1/2" diameter)
____ Adjustable, pontoon area
_ _ Adjustable, center area
____ Adjustable, double deck roofs
____ Fixed

Continued on following page

16.For Internal Floating Roof Tanks:

a.Rim Seal System Description (check one): __ Vapor Mounted Primary __ Vapor Mounted Primary plus Secondary Seal
__ Liquid Mounted Primary __ Liquid Mounted Primary plus Secondary Seal

b.Number of Columns: _____

c.Effective Column Diameter: _____ (feet)

d.Deck Type (check one): ------- Welded _____ Bolted

e.Total Deck Seam Length: _____ (feet)

f.Deck Area: _____ (square feet)

g.Deck Fitting Types (indicate the number of each type):

Access Hatch (24" diameter)
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Automatic gauge float well
____ Bolted cover, gasketed
____ Unbolted cover, gasketed
____ Unbolted cover, ungasketed

Ladder Well (36" diameter)
____ Sliding cover, gasketed
____ Sliding cover, ungasketed

Column Well (24" diameter)
____ Builtup column-sliding cover, gasketed
____ Builtup column-sliding cover, ungasketed
____ Pipe column-flexible fabric sleeve seal
____ Pipe column-sliding cover, gasketed
____ Pipe column-sliding cover, ungasketed

Sample pipe or well (24" diameter)
____ Slotted pipe-sliding cover, gasketed
____ Slotted pipe-sliding cover, ungasketed
____ Sample well-slit fabric seal 10% open area
____ Stub drain (1" diameter)

Roof leg or hanger well
____ Adjustable
____ Fixed

Vacuum breaker (10" diameter)
____ Weighted mechanical actuation, gasketed
____ Weighted mechanical actuation, ungasketed

17.For Variable Vapor Space Tanks:
Volume Expansion Capacity N/A (gallons)

18.Complete the following table for materials to be stored in this tank:

Material Stored	Annual Throughput (gal/yr)	Daily Average Amount Stored (gallons)	Material Molecular Weight (lb/lb-mole)	Material Vapor Pressure (psia)	Storage Pressure (psia)	Average Storage Temperature (°F)	Material Liquid Density (lb/gal)
Crude oil	1,734,685,200	6,505,070 Assumes 75% of the tank capacity	50	7.71	Atmospheric 13.98	65.33	6.97

19.Maximum Liquid Loading Rate of Tank:
55,556 (bbl/hr)

20.Can this tank be loaded at the same time other tanks are loaded? X Yes ___ No

If yes, indicate which other tanks can be loaded at the same time Capacity exists to fill all tanks simultaneously, but event is unlikely.

21. Describe the operations this tank will serve:
Crude oil storage

of Wisconsin
Department of Natural Resources

COMPLIANCE CERTIFICATION - MONITORING AND REPORTING
DESCRIPTION OF METHODS USED FOR DETERMINING COMPLIANCE
Form 4530-118 11-93 Information attached? N (y/n)

All applicants except non-Part 70 sources are required to certify compliance with all applicable air pollution permit requirements by including a statement within the permit application of the methods used for determining compliance (please see sec. NR 407.05(4)(i), Wis. Adm. Code.) This statement must include a description of the monitoring, recordkeeping, and reporting requirements and test methods. In addition, the application must include a schedule for compliance certification submittals during the permit term. These submittals must be no less frequent than annually, and may need to be more frequent if specified by the underlying applicable requirement or by the Department.

SEE INSTRUCTIONS ON REVERSE SIDE

1. Facility name **Enbridge Energy, Limited Partnership**	2. Facility identification number: **816010580**
3. Stack identification number: **N/A**	4. Unit identification number: **T6, T09, T10, T14, T15, T18, T19, T25, T26, T27, T30-T40**

5. This Unit will use the following method(s) for determining compliance with the requirements of the permit (check all that apply and attach the appropriate form(s) to this form).

☐ Continuous Emission Monitoring (CEM) - Form 4530-119
Pollutant(s):

☐ Periodic Emission Monitoring Using Portable Monitors - Form 4530-120
Pollutant(s):

☐ Monitoring Control System Parameters or Operating Parameters of a Process - Form 4530-121
Pollutant(s):

☐ Monitoring Maintenance Procedures - Form 4530-122
Pollutant(s):

☐ Stack Testing - Form 4530-123
Pollutant(s):

☐ Fuel Sampling and Analysis (FSA) - Form 4530-124
Pollutant(s):

☒ Recordkeeping - Form 4530-125
Pollutant(s): VOC

☐ Other (please describe) - Form 4530-135
Pollutant(s):

6. Compliance certification reports will be submitted to the Department according to the following schedule:

Start date: **January 1, 2021**
and every **12** months thereafter.

Compliance monitoring reports will be submitted to the Department according to the following schedule:

Start date: **January 1, 2021**
and every **12** months thereafter.

State of Wisconsin
Department of Natural Resources

COMPLIANCE DEMONSTRATION BY RECORDKEEPING
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-125 11-93 Information attached? _N_ (y/n)

Recordkeeping may be acceptable as a compliance demonstration method provided that a correlation between the parameter value recorded and the emission rate of a particular pollutant is established in the form of a curve or chart of emission rate versus parameter values. This correlation may constitute the certification of the system. It should be attached for Department approval. If it is not attached, please submit it within 60 days of the startup of the system.

SEE INSTRUCTIONS ON REVERSE SIDE

1. Facility name: **Enbridge Energy, Limited Partnership**	2. Facility identification number: **816010580**
3. Stack identification number: **N/A**	4. Unit identification number:**T6, T09, T10, T14, T15, T18, T19, T25, T26, T27, T30-T40**
5. Pollutant(s) being monitored: **VOC**	6. Material or parameter being monitored and recorded: **(a)** Maintain records of the emissions potential of VOC from the tank.

7. Method of monitoring and recording:
Maintain records in accordance with NR 440.285.

8. List any EPA methods used: **N/A**

9. Is this an existing method of demonstrating compliance? ☒ Yes ☐ No	10. Installation date: **Proposed October 2020**

11. Backup system: **None**

12. Compliance shall be demonstrated: ☐ Daily ☐ Weekly ☒ Monthly ☐ Batch (not to exceed monthly)

13. Indicate by checking:

The monitoring system shall be subject to appropriate performance specifications, calibration requirements, and quality assurance procedures. ☐ A quality assurance/quality control plan for the recordkeeping system is attached for Department approval. ☒ If the plan is not attached, please submit it within 60 days of the startup of the recordkeeping program. ☐ The plan was submitted to the Department on _____.

***** The compliance records shall be available for Department inspection. The format for the compliance ***** certification report and the excess emission report shall be approved by the Department. A proposed format for the compliance certification report and excess emission report shall be submitted at the same time as the application.

***** The source shall record any malfunction that causes or may cause an emission limit to be exceeded. ***** Malfunctions shall be reported to the Department the next business day. Hazardous air spills shall be reported to the Department immediately.

State of Wisconsin
Department of Natural Resources

EMISSION UNIT HAZARDOUS AIR POLLUTANT SUMMARY
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-126 11-93 Information attached? Y (y/n)

SEE INSTRUCTIONS ON REVERSE SIDE

1. Facility name: **Enbridge Energy, Limited Partnership**	2. Facility identification number: **816010580**
3. Stack identification number: **N/A**	4. Unit identification number: **T6, T09, T10, T14, T15, T18, T19, T25, T26, T27, T30-T40**

5. Unit material description: **Crude oil**

6. Complete the following summary of hazardous air emissions from this unit. Attach sample calculations and emission factor references. Attached? **See the project emission calculation summary tables in Appendix C.**

Pollutant CAS	Actual emissions		Maximum theoretical emissions		Potential to emit	
		Units		Units		
See the project emission calculation summary tables in Appendix C						TPY
						TPY
						TPY
						TPY
						TPY
						TPY
						TPY
						TPY
						TPY
						TPY
						TPY
						TPY
						TPY
						TPY
						TPY
						TPY
						TPY

State of Wisconsin
Department of Natural Resources

EMISSION UNIT SUMMARY
AIR POLLUTION CONTROL PERMIT APPLICATION
Form 4530-128 11-93 Information attached? Y (y/n)

SEE INSTRUCTIONS ON REVERSE SIDE

1. Facility name: **Enbridge Energy, Limited Partnership**	2. Facility identification number: **816010580**
3. Stack identification number: **N/A**	4. Unit identification number: **T6, T09, T10, T14, T15, T18, T19, T25, T26, T27, T30-T40**

5. Complete the following emissions summary for the following pollutants. Attach sample calculations and emission factor references.

Attached? **See the project emission calculation summary tables in Appendix B and C.**

Air pollutant	Actual			Maximum theoretical emissions			Potential to emit		Maximum allowable		
		U	TPY		U	TPY				U	TPY
Particulates								TPY			
Sulfur dioxide								TPY			
Organic compounds	**See the project emission calculation summary tables in Appendix B and C.**										
Carbon monoxide								TPY			
Lead								TPY			
Nitrogen oxides								TPY			
Total reduced sulfur								TPY			
Mercury								TPY			
Asbestos								TPY			
Beryllium								TPY			
Vinyl chloride								TPY			
								TPY			
								TPY			
								TPY			
								TPY			
								TPY			

Units (U) should be entered as follows:

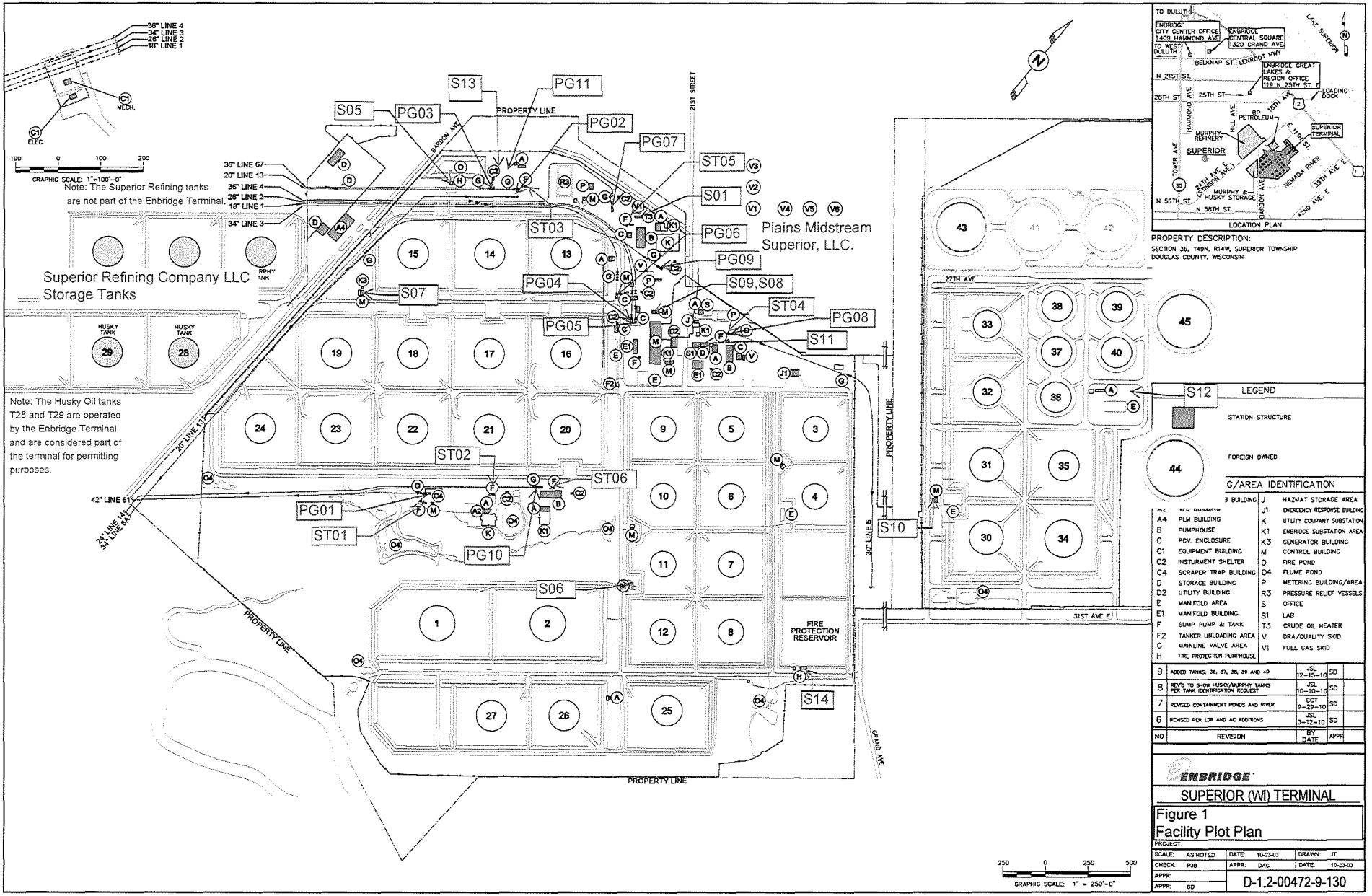
1 = lb/hr
2 = lb/mmBTU
3 = grains/dscf
4 = lb/ gallon
5 = ppmdv
6 = other (specify)
7 = other (specify)
8 = other (specify)

Appendix A

Figures

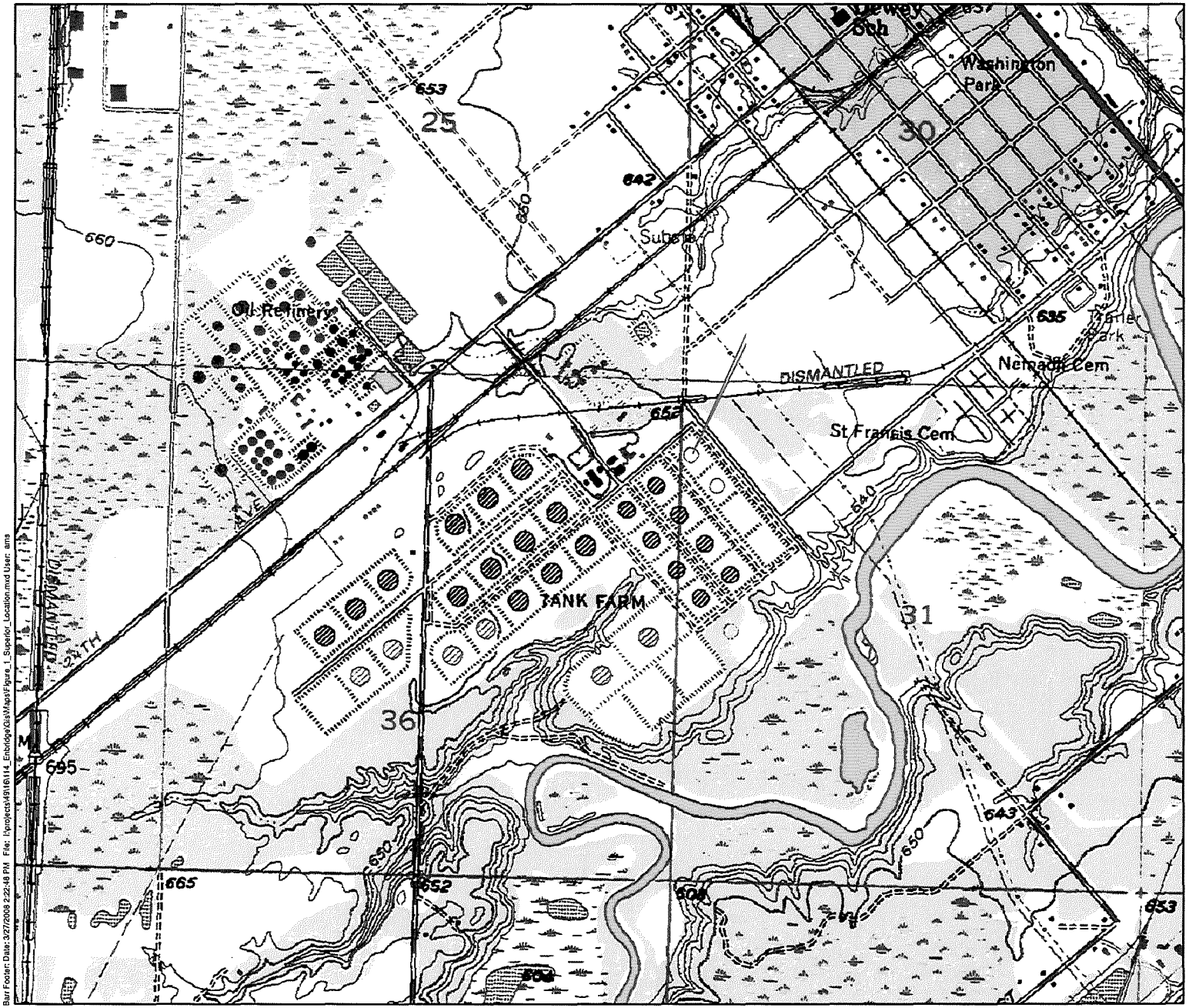
Appendix A

Figure 1 – Facility Plot Plan


Superior Refining Company LLC
Storage Tanks
Note: The Superior Refining tanks are not part of the Enbridge Terminal.
Note: The Husky Oil tanks T28 and T29 are operated by the Enbridge Terminal and are considered part of the terminal for permitting purposes.
Plains Midstream Superior, LLC.
PROPERTY LINE
21ST STREET
BARDON AVE
27TH AVE
31ST AVE E
GRAND AVE
FIRE PROTECTION RESERVOIR
S01
S02
S03
S04
S05
S06
S07
S08
S09
S10
S11
S12
S13
S14
PG01
PG02
PG03
PG04
PG05
PG06
PG07
PG08
PG09
PG10
PG11
ST01
ST02
ST03
ST04
ST05
ST06
36" LINE 4
34" LINE 3
26" LINE 1
18" LINE 1
36" LINE 67
20" LINE 13
36" LINE 4
25" LINE 2
18" LINE 1
34" LINE 3
42" LINE 51
24" LINE 14
34" LINE 6A
36" LINE 15
30" LINE 5
GRAPHIC SCALE: 1"=100'-0"
GRAPHIC SCALE: 1" = 250'-0"
LOCATION PLAN
PROPERTY DESCRIPTION:
SECTION 36, T49N, R14W, SUPERIOR TOWNSHIP
DOUGLAS COUNTY, WISCONSIN
LEGEND
STATION STRUCTURE
FOREIGN OWNED
G/AREA IDENTIFICATION
A4 PLM BUILDING
B PUMPHOUSE
C PCV ENCLOSURE
C1 EQUIPMENT BUILDING
C2 INSTRUMENT SHELTER
C4 SCRAPER TRAP BUILDING
D STORAGE BUILDING
D2 UTILITY BUILDING
E MANIFOLD AREA
E1 MANIFOLD BUILDING
F SUMP PUMP & TANK
F2 TANKER UNLOADING AREA
G MAINLINE VALVE AREA
H FIRE PROTECTION PUMPHOUSE
J HAZMAT STORAGE AREA
J1 EMERGENCY RESPONSE BUILDING
K UTILITY COMPANY SUBSTATION
K1 ENBRIDGE SUBSTATION AREA
K3 GENERATOR BUILDING
M CONTROL BUILDING
O FIRE POND
O4 FLUME POND
P METERING BUILDING/AREA
R3 PRESSURE RELIEF VESSELS
S OFFICE
S1 LAB
T3 CRUDE OIL HEATER
V DRA/QUALITY SKID
V1 FUEL GAS SKID
9 ADDED TANKS, 36, 37, 38, 39 AND 40 JSL 12-15-10 SD
8 REVD TO SHOW HUSKY/MURPHY TANKS PER TANK IDENTIFICATION REQUEST JSL 10-10-10 SD
7 REVISED CONTAINMENT PONDS AND RIVER CCT 9-29-10 SD
6 REVISED PER LSR AND AC ADDITIONS JSL 3-12-10 SD
NO REVISION BY DATE APPR
ENBRIDGE
SUPERIOR (WI) TERMINAL
Figure 1
Facility Plot Plan
PROJECT:
SCALE: AS NOTED DATE: 10-23-03 DRAWN: JT
CHECK: PJB APPR: DAC DATE: 10-23-03
APPR:
APPR: SD
D-1.2-00472-9-130

Appendix A

Figure 2 – Site Location Map



0 500 1,000 2,000 Feet

0 137.5 275 550 Meters

ENBRIDGE

BARR

Figure 2

Site Location Map
Enbridge Energy, Limited Partnership
Superior, WI

Barr Footer: Date: 3/27/2008 2:22:49 PM File: I:\projects\49\116\114_Enbridge\GIs\Maps\Figure_1_Superior_Location.mxd User: ams

Appendix B

Prevention of Significant Deterioration (PSD) Applicability Volatile Organic Compound Emission Calculations

Table 1-1
Enbridge Energy, Limited Partnership - Superior, WI Terminal
Superior Terminal Enhancements 2020
Prevention of Significant Deterioration (PSD) Applicability Volatile Organic Compound Emission Calculation Summary

Emission Unit Description	Potential to Emit[1] (tpy)	Baseline Actual Emissions[2] (tpy)	Emission Increase[3] (tpy)	Comments
"Existing" Modified Storage Tanks[4]				
T06	5.69	9.29	-	Tank modified with one additional vacuum breaker
T09	5.70	3.25	2.46	Tank modified with one additional vacuum breaker
T10	5.70	2.67	3.02	Tank modified with one additional vacuum breaker
T14	6.86	1.37	5.49	Tank modified with one additional vacuum breaker
T15	6.86	1.93	4.93	Tank modified with one additional vacuum breaker
T18	6.86	2.00	4.86	Tank modified with one additional vacuum breaker
T19	6.85	5.68	1.17	Tank modified with one additional vacuum breaker
T25	7.02	3.92	3.10	Tank modified with one additional vacuum breaker
T26	5.27	2.50	2.78	Tank modified with one additional vacuum breaker
T27	7.07	2.53	4.55	Tank modified with one additional vacuum breaker
T30	7.55	2.93	4.62	Tank modified with one additional vacuum breaker
T31	7.44	3.46	3.98	Tank modified with one additional vacuum breaker
T32	6.39	2.94	3.45	Tank modified with one additional vacuum breaker
T33	6.46	3.44	3.02	Tank modified with one additional vacuum breaker
T34	9.85	1.34	8.51	Tank modified with one additional vacuum breaker
T35	6.36	2.96	3.40	Tank modified with one additional vacuum breaker
T36	6.36	4.98	1.38	Tank modified with one additional vacuum breaker
T37	6.36	3.88	2.48	Tank modified with one additional vacuum breaker
T38	6.36	3.66	2.70	Tank modified with one additional vacuum breaker
T39	6.36	2.94	3.42	Tank modified with one additional vacuum breaker
T40	6.36	4.98	1.38	Tank modified with one additional vacuum breaker
"Existing" Non-Modified Storage Tanks[5]				
Storage Tank Standing and Withdrawal Loss Emissions[6]	154.68	95.37	59.31	Other terminal tanks which will not require vacuum breaker or other physical modifications

PSD Project Emission Increases[3,7] (ton VOC/year)	**130.01**
Prevention of Significant Deterioration Significant Emission Threshold (ton VOC/year)	**40**
Is total project emissions increase greater than the Prevention of Significant Deterioration Emission Threshold?	**Yes**

Notes:
1. Storage tank potential to emit resulting from the proposed pipeline throughput capacity increase and tank modifications. Refer to the potential storage tank standing and withdrawal loss emission calculations in Table 2-2 in Appendix C.
2. Refer to Table 1-3 for the baseline actual emissions. Emissions from the 24-month period 2015 and 2016 is selected as the baseline period.
3. The proposed project includes only existing emission units. The emissions increase is calculated per the requirements specified in NR 405.025(3) Wis. Adm. Code as the sum of the difference between the potential to emit emissions and the baseline actual emissions.
4. Existing modified storage tanks which may realize an increased utilization as a result of the proposed pipeline throughput capacity increases and require the construction of one additional vacuum breaker per tank to accommodate the increased withdrawal rate from the tanks. The project will not impact the storage tank roof landing and cleaning events which are independent of pipeline throughput capacity changes and tank modifications.

5. Existing non-modified project affected storage tanks which may realize an increased utilization as a result of the proposed pipeline throughput capacity increases. The emissions represent the worst case project related emissions increase as a result of the proposed project. The project will not impact the storage tank roof landing and cleaning events which are independent of pipeline throughput capacity changes. Includes the all terminal tanks not included as part of the modified storage tank group.
6. Refer to the potential non-modified storage tank standing loss calculations in Table 2-2 in Appendix C and the potential tank withdrawal loss calculations for the non-modified storage tanks based on the maximum terminal throughput capacity of 3,013,333 barrels per day in Table 1-2.
7. The proposed Project emission increase is above the 40 tpy volatile organic compounds (VOC) significant emission rate for ozone as defined at 40 CFR 52.21(b) 23 and s. NR 405.02 (27)(a). As a result, Enbridge is submitting this PSD permit application for the proposed project.

Table 1-2
Enbridge Energy, Limited Partnership - Superior, WI Terminal
Superior Terminal Enhancements 2020
Potential to Emit Withdrawal Loss Calculations

Proposed Terminal Throughput Capacity[1] (bbl/day) 3,013,333
Potential Terminal Throughput Capacity[2] (bbl/yr) 1,099,866,545

				Q	D	N_C	F_C	C_S	W_L	0.943	L_{WD}	
Storage Tank Number	Tank Type	Storage Tank Volume (bbl)	Percent of Total Terminal Working Volume	Tank Throughput[3] (bbl/yr)	Tank Diameter (ft)	Number of fixed roof support columns	Effective column diameter	Shell Clingage factor[4] (bbl/1000 ft^2)	Annual Average Organic Liquid Density[5] (lb/gal)	Constant (1000 ft^3 gal/bbl^2)	Potential Withdrawal Losses[6] (lb VOC/yr)	Potential Withdrawal Losses (ton VOC/yr)
T01	EFRT	390,000	3.42%	37,669,626	210	-	-	0.006	6.97	0.943	7,074	3.54
T02	EFRT	390,000	3.42%	37,669,626	210	-	-	0.006	6.97	0.943	7,074	3.54
T03	DEFRT	150,000	1.32%	14,488,318	150	-	-	0.006	6.97	0.943	3,809	1.90
T04	DEFRT	150,000	1.32%	14,488,318	150	-	-	0.006	6.97	0.943	3,809	1.90
T05	EFRT	150,000	1.32%	14,488,318	150	-	-	0.006	6.97	0.943	3,809	1.90
T06	EFRT	150,000	1.32%	14,488,318	150	-	-	0.006	6.97	0.943	3,809	1.90
T07	EFRT	150,000	1.32%	14,488,318	150	-	-	0.006	6.97	0.943	3,809	1.90
T08	EFRT	150,000	1.32%	14,488,318	150	-	-	0.006	6.97	0.943	3,809	1.90
T09	EFRT	150,000	1.32%	14,488,318	150	-	-	0.006	6.97	0.943	3,809	1.90
T10	EFRT	150,000	1.32%	14,488,318	150	-	-	0.006	6.97	0.943	3,809	1.90
T11	EFRT	150,000	1.32%	14,488,318	150	-	-	0.006	6.97	0.943	3,809	1.90
T12	EFRT	150,000	1.32%	14,488,318	150	-	-	0.006	6.97	0.943	3,809	1.90
T13	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T14	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T15	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T16	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T17	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T18	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T19	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T20	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T21	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T22	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T23	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T24	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T25	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T26	DEFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T27	EFRT	217,000	1.91%	20,959,766	180	-	-	0.006	6.97	0.943	4,592	2.30
T28	IFRT	217,000	1.91%	20,959,766	180	25	1	0.006	6.97	0.943	5,230	2.61
T29	IFRT	217,000	1.91%	20,959,766	180	25	1	0.006	6.97	0.943	5,230	2.61
T30	EFRT	250,000	2.20%	24,147,196	200	-	-	0.006	6.97	0.943	4,761	2.38
T31	EFRT	250,000	2.20%	24,147,196	200	-	-	0.006	6.97	0.943	4,761	2.38
T32	EFRT	182,857	1.61%	17,661,949	165	-	-	0.006	6.97	0.943	4,221	2.11
T33	EFRT	182,857	1.61%	17,661,949	165	-	-	0.006	6.97	0.943	4,221	2.11
T34	EFRT	392,169	3.44%	37,879,127	224	-	-	0.006	6.97	0.943	6,669	3.33
T35	EFRT	206,510	1.81%	19,946,564	180	-	-	0.006	6.97	0.943	4,370	2.19
T36	EFRT	206,510	1.81%	19,946,564	180	-	-	0.006	6.97	0.943	4,370	2.19
T37	EFRT	206,510	1.81%	19,946,564	180	-	-	0.006	6.97	0.943	4,370	2.19
T38	EFRT	206,510	1.81%	19,946,564	180	-	-	0.006	6.97	0.943	4,370	2.19
T39	EFRT	206,510	1.81%	19,946,564	180	-	-	0.006	6.97	0.943	4,370	2.19
T40	EFRT	206,510	1.81%	19,946,564	180	-	-	0.006	6.97	0.943	4,370	2.19
T41	EFRT	584,232	5.13%	56,430,259	286	-	-	0.006	6.97	0.943	7,781	3.89
T42	EFRT	584,232	5.13%	56,430,259	286	-	-	0.006	6.97	0.943	7,781	3.89
T43	EFRT	584,232	5.13%	56,430,259	286	-	-	0.006	6.97	0.943	7,781	3.89
T44	EFRT	584,232	5.13%	56,430,259	286	-	-	0.006	6.97	0.943	7,781	3.89
T45	EFRT	584,232	5.13%	56,430,259	286	-	-	0.006	6.97	0.943	7,781	3.89
	Total	11,387,104		1,099,866,545							Total	110.67
	Modified Storage Tank Total[7]	4,465,944		431,360,115							Modified Storage Tank Total	47.21
	Non-modified Storage Tank Total[8]	6,921,160		668,506,430							Non-modified Storage Tank Total	63.46

Notes:

1. Potential to emit withdrawal loss emissions are calculated based on the potential outbound pipeline capacity of 3,013,333 bbl/day. The terminal's throughput capacity will continue to be outbound pipeline limited after construction of the proposed Project. Refer to Table 1-5 for a summary of the maximum terminal throughput capacity.
2. Calculated based on operation 365 days per year at maximum annual pipeline design capacity.
3. Individual storage tank throughput is calculated using a tank volume flow weighted throughput allocation, this calculation method results in the same number of turnovers for all existing tanks. The individual tank throughput is calculated by multiplying the potential facility-wide throughput by the storage tank capacity and dividing by the combined terminal tank capacity.
4. USEPA, AP-42, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Chapter 7.1, Organic Storage Tanks, Table 7.1-10, November 2006, crude oil service with a light rust shell condition.
5. Represents the density of the LSB crude type which has the highest vapor pressure of the crude oil types stored at the Superior Terminal.
6. Withdrawal loss formula from US Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, Volume 1, 5th edition, AP-42, Chapter 7.1 Liquid Storage Tanks, November 2006, Formula 2-4.
7. Existing modified storage tanks which may realize an increased utilization as a result of the proposed pipeline throughput capacity increases and require the construction of one additional vacuum breaker per tank to accommodate the increased withdrawal rate from the tanks. Refer to Table 1-1 for the list of modified tanks.
8. Existing non-modified project affected storage tanks which may realize an increased utilization as a result of the proposed pipeline throughput capacity increases. Includes the all terminal tanks not included as part of the modified storage tank group.

Table 1-3
Enbridge Energy, Limited Partnership - Superior, WI Terminal
Superior Terminal Enhancements 2020
Baseline Actual Throughput and Volatile Organic Compound Emission Summary[1]

Annual Emission Inventory Reporting Year	Total Facility Storage Tank Throughput (bbl/yr)	Total Facility Storage Tank Throughput (bbl/day)	Facility-wide Standing Loss Emissions (tpy)	Facility-wide Withdrawal Loss Emissions (tpy)	Facility-wide Standing and Withdrawal Loss Emissions (tpy)	"Modified" Tank Standing and Withdrawal Loss Emissions[2] (tpy)	"Non-modified" Tank Standing and Withdrawal Loss Emissions[3] (tpy)	Comments
2018	736,878,096	2,018,844	81.49	70.76	152.25	65.60	86.65	
2017	712,019,096	1,950,737	88.12	68.63	156.75	65.29	91.45	
2016	672,692,236	1,842,992	106.38	65.19	171.57	71.98	99.59	Baseline period
2015	712,269,510	1,951,423	91.75	72.73	164.48	73.33	91.15	Baseline period
2014	638,552,912	1,749,460	87.09	70.89	157.98	64.44	93.54	

"Modified" Emission Unit - Standing and Withdrawal Loss Emissions

Annual Emission Inventory Reporting Year	Storage Tank Number													
	T06	T09	T10	T14	T15	T18	T19	T25	T26	T27	T30	T31	T32	T33
2018	9.19	2.33	2.75	2.47	2.12	2.56	4.07	3.96	2.54	2.18	2.55	2.23	3.02	0.73
2017	9.37	2.44	3.84	2.23	2.09	2.04	4.40	4.05	2.38	1.99	1.00	2.20	3.48	1.45
2016	9.56	3.17	2.62	2.42	1.55	1.68	5.55	3.64	2.33	1.94	2.93	3.63	3.11	3.22
2015	9.02	3.32	2.73	0.32	2.31	2.32	5.81	4.21	2.67	3.11	2.94	3.29	2.77	3.67
2014	7.13	1.85	2.56	2.37	2.97	2.96	4.93	4.11	1.91	4.39	2.77	3.96	2.39	2.61

Notes:

1. Actual throughput and emissions from annual emission inventory reporting. Emissions from the 24-month period 2015 and 2016 is selected as the baseline period.
2. Existing modified storage tanks which may realize an increased utilization as a result of the proposed pipeline throughput capacity increases and require the construction of one additional vacuum breaker per tank to accommo
3. Existing non-modified project affected storage tanks which may realize an increased utilization as a result of the proposed pipeline throughput capacity increases. Includes the all terminal tanks not included as part of the modifi

Table 1-4
Enbridge Energy, Limited Partnership - Superior, WI Terminal
Superior Terminal Enhancements 2020
Permitted Maximum Terminal Throughput Capacity Summary[1]

Inbound Pipeline Number	Maximum Annual Pipeline Design Capacity (m^3/day)	Maximum Annual Pipeline Design Capacity (bbl/day)	Maximum Annual Pipeline Design Capacity (gal/day)	Comments
1	38,000	237,000	9,954,000	No Change
2b	70,000	442,000	18,564,000	No Change
3	121,000	760,000	31,920,000	No Change
4	140,624	884,500	37,149,000	Proposed increase from 796,000 bbl/day
67	141,483	889,900	37,375,800	Proposed increase from 800,000 bbl/day
Total	511,107	3,213,400	134,962,800	

Outbound Pipeline Number	Maximum Annual Pipeline Design Capacity (m^3/day)	Maximum Annual Pipeline Design Capacity (bbl/day)	Maximum Annual Pipeline Design Capacity (gal/day)	Comments
5	85,844	540,000	22,680,000	No Change
6a	106,033	667,000	28,014,000	No Change
14/64	60,091	378,000	15,876,000	No Change
61	211,983	1,333,333	55,999,986	Proposed increase from 1,200,000 bbl/day
Superior Refining Company LLC Takeoff	15,102	95,000	3,990,000	No Change
Total	479,053	3,013,333	126,559,986	

Notes:

1. The terminal throughput capacity is bottlenecked by the maximum terminal outbound pipeline capacity of 3,013,333 bpd after construction of the proposed Project.

Table 1-5
Enbridge Energy, Limited Partnership - Superior, WI Terminal
Superior Terminal Enhancements 2020
Prevention of Significant Deterioration (PSD) Applicability Green House Gas Emission Calculation Summary

Emission Unit ID	Potential to Emit Tank Throughput[1] (MMgal/yr)	CH_4 Emission Factor[2] (lb CH_4/MMgal)	Potential CH_4 Emissions (lb/yr)	Potential CH_4 Emissions (tpy)	Potential CO_2 Equivalent Emissions[3,4] (CO_2e, tpy)	Baseline Actual Tank Throughput[5] (MMgal/yr)	Baseline Actual CH_4 Emissions (lb/yr)	Baseline Actual CH_4 Emissions (tpy)	Baseline Actual CO_2 Equivalent Emissions[3,4] (CO_2e, tpy)	Emission Increase[6] (CO_2e, tpy)
"Existing" Modified Storage Tanks[7]										
T06	1,260	5.25	6,614	3.31	83	446	2,343	1.17	29	53.38
T09	1,260	5.25	6,614	3.31	83	334	1,754	0.88	22	60.75
T10	1,260	5.25	6,614	3.31	83	77	405	0.20	5	77.60
T14	1,823	5.25	9,568	4.78	120	200	1,048	0.52	13	106.50
T15	1,823	5.25	9,568	4.78	120	339	1,781	0.89	22	97.34
T18	1,823	5.25	9,568	4.78	120	367	1,927	0.96	24	95.51
T19	1,823	5.25	9,568	4.78	120	511	2,684	1.34	34	86.06
T25	1,823	5.25	9,568	4.78	120	723	3,796	1.90	47	72.15
T26	1,823	5.25	9,568	4.78	120	805	4,224	2.11	53	66.80
T27	1,823	5.25	9,568	4.78	120	620	3,255	1.63	41	78.91
T30	2,100	5.25	11,023	5.51	138	658	3,455	1.73	43	94.60
T31	2,100	5.25	11,023	5.51	138	602	3,158	1.58	39	98.31
T32	1,536	5.25	8,063	4.03	101	399	2,094	1.05	26	74.61
T33	1,536	5.25	8,063	4.03	101	485	2,545	1.27	32	68.97
T34	3,294	5.25	17,292	8.65	216	498	2,616	1.31	33	183.45
T35	1,735	5.25	9,106	4.55	114	495	2,600	1.30	33	81.31
T36	1,735	5.25	9,106	4.55	114	1,033	5,422	2.71	68	46.04
T37	1,735	5.25	9,106	4.55	114	783	4,112	2.06	51	62.42
T38	1,735	5.25	9,106	4.55	114	808	4,243	2.12	53	60.78
T39	1,735	5.25	9,106	4.55	114	610	3,202	1.60	40	73.79
T40	1,735	5.25	9,106	4.55	114	1,093	5,739	2.87	72	42.08
"Existing" Non-Modified Storage Tanks[8]										
Non-Modified Storage Tanks	28,077	5.25	147,380	73.69	1,842	17,195.55	90,261	45.13	1,128	713.99
									Total[9]	2,395.36

Notes

1. Refer to Table 2-8 in Appendix C for tank throughputs, assumes 200 tank turnover per year for the existing modified tanks.
2. Methane emission factor obtained from 40 CFR 98.253 (m)(1), equation Y-22. Original value of 0.1 metric ton/MMbbl converted to 5.25 lb/MMgal.
3. Global warming potential (GWP) obtained from Table A-1 to Subpart A of Part 98 - Global Warming Potentials.
4. CO_2e calculated by equation A-1 of 40 CFR 98.2, which states the total CO_2e is equal to the GWP factor for CH_4 multiplied by the potential CH_4 emissions. The global warming potential for CH_4 is 25.
5. Baseline emissions for the existing tanks is the actual terminal throughput for the 24-month period 2015 and 2016, refer to the total facility storage tank throughput in Table 1-3.
6. Project emission increase conservatively includes increased throughput due to debottlenecking of the terminals outbound pipeline capacity.
7. Existing modified storage tanks which may realize an increased utilization as a result of the proposed pipeline throughput capacity increases.
8. Existing non-modified project affected storage tanks which may realize an increased utilization as a result of the proposed pipeline throughput capacity increases. Includes the all terminal tanks not included as part of the modified storage tank group.
9. The project will not debottleneck, modify or otherwise physically change the terminal's crude heater or other combustion sources. The crude heater is only used to heat crude oil delivered on Line 6A which will not be debottlenecked as a result of the proposed project.

Table 1-6
Enbridge Energy, Limited Partnership - Superior, WI Terminal
Superior Terminal Enhancements 2020
Physically Modified Storage Tank New Source Performance Standard Applicability Analysis[1]

Physically Modified Storage Tank Number	Pre-Project NSPS Status	Pre-Project Maximum Standing Loss Emissions[2] (lb/month)	Pre-Project Maximum Standing Loss Emissions[3] (lb/hr)	Pre-Project Maximum Withdrawal Losses[4] (lb/hr)	Pre-Project Maximum Hourly Losses[5] (kg/hr)	Post-Project Maximum Standing Loss Emissions[6] (lb/month)	Post-Project Maximum Standing Loss Emissions[3] (lb/hr)	Post-Project Maximum Withdrawal Losses[7] (lb/hr)	Post-Project Maximum Hourly Losses[5] (kg/hr)	Post-Project Emission Increase[8] (kg/hr)	Post-Project NSPS Status	Comments
T06	Grandfathered	1,797.44	2.42	13.15	7.06	408.44	0.55	14.61	6.87	(0.18)	Grandfathered	Adding additional deck fitting controls will result in an emissions decrease[9].
T09	Kb	404.85	0.54	13.15	6.21	410.86	0.55	14.61	6.88	0.67	Kb	
T10	Grandfathered	1,830.29	2.46	13.15	7.08	409.25	0.55	14.61	6.87	(0.20)	Grandfathered	Adding additional deck fitting controls will result in an emissions decrease[9].
T14	Grandfathered	486.58	0.65	10.95	5.27	492.59	0.66	12.17	5.82	0.56	Kb	Tank will become an affected facility under NSPS Kb
T15	Grandfathered	486.58	0.65	10.95	5.27	492.59	0.66	12.17	5.82	0.56	Kb	Tank will become an affected facility under NSPS Kb
T18	Grandfathered	486.58	0.65	10.95	5.27	492.59	0.66	12.17	5.82	0.56	Kb	Tank will become an affected facility under NSPS Kb
T19	Grandfathered	1,269.12	1.71	10.95	5.74	489.87	0.66	12.17	5.82	0.08	Kb	Tank will become an affected facility under NSPS Kb
T25	Kb	521.81	0.70	10.95	5.29	527.82	0.71	12.17	5.84	0.56	Kb	
T26	Kb	125.24	0.17	10.95	5.05	128.36	0.17	12.17	5.60	0.55	Kb	
T27	Kb	534.88	0.72	10.95	5.29	540.89	0.73	12.17	5.85	0.56	Kb	
T30	Kb	605.87	0.81	9.86	4.84	611.88	0.82	10.95	5.34	0.50	Kb	
T31	Kb	578.77	0.78	9.86	4.82	584.78	0.79	10.95	5.33	0.50	Kb	
T32	Kb	531.95	0.71	11.95	5.74	470.83	0.63	13.28	6.31	0.57	Kb	
T33	Kb	548.88	0.74	11.95	5.76	487.76	0.66	13.28	6.32	0.57	Kb	
T34	Kb	678.98	0.91	8.80	4.41	684.99	0.92	9.78	4.85	0.45	Kb	
T35	Kb	483.32	0.65	10.95	5.26	489.34	0.66	12.17	5.82	0.56	Kb	
T36	Kb	454.93	0.61	10.95	5.25	460.94	0.62	12.17	5.80	0.56	Kb	
T37	Kb	454.93	0.61	10.95	5.25	460.94	0.62	12.17	5.80	0.56	Kb	
T38	Kb	454.93	0.61	10.95	5.25	460.94	0.62	12.17	5.80	0.56	Kb	
T39	Kb	454.93	0.61	10.95	5.25	460.94	0.62	12.17	5.80	0.56	Kb	
T40	Kb	454.93	0.61	10.95	5.25	460.94	0.62	12.17	5.80	0.56	Kb	

Notes:
1. The existing "Grandfathered" non-NSPS Kb storage tanks which will be physically modified as part of the proposed Project could potentially become affected facilities subject to New Source Performance Standard (NSPS) requirements of 40 CFR 60 Subpart Kb as a result of the project. The existing non-modified storage tanks which may realize an increased utilization as a result of the proposed pipeline throughput capacity increase are not considered modified under the NSPS regulations, the tanks can accommodate the increased potential throughput without a physical modification.
2. Pre-project standing loss emissions from the Line 3 Replacement Project (Permit Number 17-DCF-091), emissions are from the month of July which has the highest potential monthly emission rate.
3. Maximum monthly standing loss emission rate divided by the number of hours in the month.
4. Pre-project withdrawal loss emissions are calculated based on a maximum potential withdrawal rate of 50,000 barrels per hour which is equal to the Line 61 withdrawal rate of 1,200,000 barrels per day. Refer to the withdrawal loss calculations in Table 1-7.
5. Sum of the maximum hourly standing and withdrawal loss emissions.

6. Post-project proposed standing loss emissions from the month of July which has the highest potential monthly emission rate. The emission reduction is a result of that addition of BACT and NSPS Kb emission controls.
7. Post-project withdrawal loss emissions are calculated based on a maximum potential withdrawal rate of 55,556 barrels per hour which is equal to the proposed increased Line 61 withdrawal rate of 1,333,333 barrels per day. Refer to the withdrawal loss calculations in Table 1-7.
8. The emission increase is calculated as the difference between the post-project maximum hourly emission rate and the pre-project maximum hourly emission rate. The proposed tank modifications and throughput increas will result in an emissions increase with will result in tanks T09, T14, T15, T18 and T19 becoming affected facilities subject to requirements of 40 CFR 60 Subpart Kb.
9. To meet BACT, Enbridge proposes to install slotted guide-pole controls which will result in a decrease in potential tank standing loss emissions.

Table 1-7
Enbridge Energy, Limited Partnership - Superior, WI Terminal
Superior Terminal Enhancements 2020
Maximum Potential Hourly Withdrawal Loss Calculations for NSPS Applicability Analysis[1]

Pre-Project Maximum Potential Tank Withdrawal Rate[2] (bbl/hr) 50,000
Pre-Project Maximum Potential Tank Withdrawal Rate[2] (bbl/day) 1,200,000

			Q	D	N_C	F_C	C_S	W_L	0.943	L_{WD}
Storage Tank Number	Tank Type	Storage Tank Volume (bbl)	Tank Throughput (bbl/hr)	Tank Diameter (ft)	Number of fixed roof support columns	Effective column diameter	Shell Clingage factor[3] (bbl/1000 ft^2)	Annual Average Organic Liquid Density[4] (lb/gal)	Constant (1000 ft^3 gal/bbl^2)	Potential Withdrawal Losses[5] (lb VOC/hr)
T06	EFRT	150,000	50,000	150	-	-	0.006	6.97	0.943	13.15
T09	EFRT	150,000	50,000	150	-	-	0.006	6.97	0.943	13.15
T10	EFRT	150,000	50,000	150	-	-	0.006	6.97	0.943	13.15
T14	EFRT	217,000	50,000	180	-	-	0.006	6.97	0.943	10.95
T15	EFRT	217,000	50,000	180	-	-	0.006	6.97	0.943	10.95
T18	EFRT	217,000	50,000	180	-	-	0.006	6.97	0.943	10.95
T19	EFRT	217,000	50,000	180	-	-	0.006	6.97	0.943	10.95
T25	EFRT	217,000	50,000	180	-	-	0.006	6.97	0.943	10.95
T26	DEFRT	217,000	50,000	180	-	-	0.006	6.97	0.943	10.95
T27	EFRT	217,000	50,000	180	-	-	0.006	6.97	0.943	10.95
T30	EFRT	250,000	50,000	200	-	-	0.006	6.97	0.943	9.86
T31	EFRT	250,000	50,000	200	-	-	0.006	6.97	0.943	9.86
T32	EFRT	182,857	50,000	165	-	-	0.006	6.97	0.943	11.95
T33	EFRT	182,857	50,000	165	-	-	0.006	6.97	0.943	11.95
T34	EFRT	392,169	50,000	224	-	-	0.006	6.97	0.943	8.80
T35	EFRT	206,510	50,000	180	-	-	0.006	6.97	0.943	10.95
T36	EFRT	206,510	50,000	180	-	-	0.006	6.97	0.943	10.95
T37	EFRT	206,510	50,000	180	-	-	0.006	6.97	0.943	10.95
T38	EFRT	206,510	50,000	180	-	-	0.006	6.97	0.943	10.95
T39	EFRT	206,510	50,000	180	-	-	0.006	6.97	0.943	10.95
T40	EFRT	206,510	50,000	180	-	-	0.006	6.97	0.943	10.95

Notes:

1. Maximum potential pre-project hourly withdrawal loss emission calculations used in the modified storage tanks NSPS appliability analysis in Table 1-6.
2. Maximum potential withdrawal loss emissions calculated based on the pipeline throughput capacity of Line 61 which is the outbound pipeline with the highest potential capacity.
3. USEPA, AP-42, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Chapter 7.1, Organic Storage Tanks, Table 7.1-10, November 2006, crude oil service with a light rust shell condition.
4. Represents the density of the LSB crude type which has the highest vapor pressure of the crude oil types stored at the Superior Terminal.
5. Withdrawal loss formula from US Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, Volume 1, 5th edition, AP-42, Chapter 7.1 Liquid Storage Tanks, November 2006, Formula 2-4.

Post-Project Maximum Potential Tank Withdrawal Rate[2] (bbl/hr) 55,556
Post-Project Maximum Potential Tank Withdrawal Rate[2] (bbl/day) 1,333,333

			Q	D	N_C	F_C	C_S	W_L	0.943	L_{WD}
Storage Tank Number	Tank Type	Storage Tank Volume (bbl)	Tank Throughput (bbl/hr)	Tank Diameter (ft)	Number of fixed roof support columns	Effective column diameter	Shell Clingage factor[3] (bbl/1000 ft^2)	Annual Average Organic Liquid Density[4] (lb/gal)	Constant (1000 ft^3 gal/bbl^2)	Potential Withdrawal Losses[5] (lb VOC/hr)
T06	EFRT	150,000	55,556	150	-	-	0.006	6.97	0.943	14.61
T09	EFRT	150,000	55,556	150	-	-	0.006	6.97	0.943	14.61
T10	EFRT	150,000	55,556	150	-	-	0.006	6.97	0.943	14.61
T14	EFRT	217,000	55,556	180	-	-	0.006	6.97	0.943	12.17
T15	EFRT	217,000	55,556	180	-	-	0.006	6.97	0.943	12.17
T18	EFRT	217,000	55,556	180	-	-	0.006	6.97	0.943	12.17
T19	EFRT	217,000	55,556	180	-	-	0.006	6.97	0.943	12.17
T25	EFRT	217,000	55,556	180	-	-	0.006	6.97	0.943	12.17
T26	DEFRT	217,000	55,556	180	-	-	0.006	6.97	0.943	12.17
T27	EFRT	217,000	55,556	180	-	-	0.006	6.97	0.943	12.17
T30	EFRT	250,000	55,556	200	-	-	0.006	6.97	0.943	10.95
T31	EFRT	250,000	55,556	200	-	-	0.006	6.97	0.943	10.95
T32	EFRT	182,857	55,556	165	-	-	0.006	6.97	0.943	13.28
T33	EFRT	182,857	55,556	165	-	-	0.006	6.97	0.943	13.28
T34	EFRT	392,169	55,556	224	-	-	0.006	6.97	0.943	9.78
T35	EFRT	206,510	55,556	180	-	-	0.006	6.97	0.943	12.17
T36	EFRT	206,510	55,556	180	-	-	0.006	6.97	0.943	12.17
T37	EFRT	206,510	55,556	180	-	-	0.006	6.97	0.943	12.17
T38	EFRT	206,510	55,556	180	-	-	0.006	6.97	0.943	12.17
T39	EFRT	206,510	55,556	180	-	-	0.006	6.97	0.943	12.17
T40	EFRT	206,510	55,556	180	-	-	0.006	6.97	0.943	12.17

Notes:

1. Maximum potential post-project hourly withdrawal loss emission calculations used in the modified storage tanks NSPS appliability analysis in Table 1-6.
2. Maximum potential withdrawal loss emissions calculated based on the pipeline throughput capacity of Line 61 which is the outbound pipeline with the highest potential capacity.
3. USEPA, AP-42, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Chapter 7.1, Organic Storage Tanks, Table 7.1-10, November 2006, crude oil service with a light rust shell condition.
4. Represents the density of the LSB crude type which has the highest vapor pressure of the crude oil types stored at the Superior Terminal.
5. Withdrawal loss formula from US Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, Volume 1, 5th edition, AP-42, Chapter 7.1 Liquid Storage Tanks, November 2006, Formula 2-4.

Appendix C

Facility-Wide Potential to Emit Calculation Summary Tables

Table 2-1
Enbridge Energy, Limited Partnership - Superior, WI Terminal
MTE/PTE Emission Calculation Summary

	Emissions[1] (ton/yr)													
Emission Unit ID	VOC	Total Federal HAP	Highest Single HAP (n-Hexane)	PM	PM10	PM2.5	Lead	SO_2	NOx	CO	CO_2	CH_4	Nitrous oxide	CO_2e
T01	9.47	0.45	0.27	-	-	-	-	-	-	-	-	3.74	-	93.50
T02	15.63	0.69	0.45	-	-	-	-	-	-	-	-	3.74	-	93.50
T03	4.03	0.20	0.11	-	-	-	-	-	-	-	-	1.44	-	35.96
T04	3.94	0.20	0.11	-	-	-	-	-	-	-	-	1.44	-	35.96
T05	3.50	0.18	0.10	-	-	-	-	-	-	-	-	1.44	-	35.96
T06	5.69	0.33	0.15	-	-	-	-	-	-	-	-	3.31	-	82.67
T07	3.56	0.19	0.10	-	-	-	-	-	-	-	-	1.44	-	35.96
T08	7.30	0.33	0.21	-	-	-	-	-	-	-	-	1.44	-	35.96
T09	5.70	0.33	0.15	-	-	-	-	-	-	-	-	3.31	-	82.67
T10	5.70	0.33	0.15	-	-	-	-	-	-	-	-	3.31	-	82.67
T11	4.15	0.21	0.12	-	-	-	-	-	-	-	-	1.44	-	35.96
T12	4.81	0.23	0.14	-	-	-	-	-	-	-	-	1.44	-	35.96
T13	4.30	0.22	0.12	-	-	-	-	-	-	-	-	2.08	-	52.03
T14	6.86	0.40	0.18	-	-	-	-	-	-	-	-	4.78	-	119.60
T15	6.86	0.40	0.18	-	-	-	-	-	-	-	-	4.78	-	119.60
T16	4.10	0.22	0.11	-	-	-	-	-	-	-	-	2.08	-	52.03
T17	10.47	0.46	0.30	-	-	-	-	-	-	-	-	2.08	-	52.03
T18	6.86	0.40	0.18	-	-	-	-	-	-	-	-	4.78	-	119.60
T19	6.85	0.40	0.18	-	-	-	-	-	-	-	-	4.78	-	119.60
T20	10.54	0.46	0.30	-	-	-	-	-	-	-	-	2.08	-	52.03
T21	4.27	0.22	0.12	-	-	-	-	-	-	-	-	2.08	-	52.03
T22	4.16	0.22	0.11	-	-	-	-	-	-	-	-	2.08	-	52.03
T23	4.15	0.22	0.11	-	-	-	-	-	-	-	-	2.08	-	52.03
T24	4.16	0.22	0.11	-	-	-	-	-	-	-	-	2.08	-	52.03
T25	7.02	0.40	0.19	-	-	-	-	-	-	-	-	4.78	-	119.60
T26	5.27	0.34	0.13	-	-	-	-	-	-	-	-	4.78	-	119.60
T27	7.07	0.41	0.19	-	-	-	-	-	-	-	-	4.78	-	119.60
T28	8.35	0.39	0.24	-	-	-	-	-	-	-	-	2.08	-	52.03
T29	8.02	0.38	0.23	-	-	-	-	-	-	-	-	2.08	-	52.03
T30	7.55	0.43	0.20	-	-	-	-	-	-	-	-	5.51	-	137.79
T31	7.44	0.43	0.20	-	-	-	-	-	-	-	-	5.51	-	137.79
T32	6.39	0.37	0.17	-	-	-	-	-	-	-	-	4.03	-	100.78
T33	6.46	0.37	0.17	-	-	-	-	-	-	-	-	4.03	-	100.78
T34	9.85	0.57	0.26	-	-	-	-	-	-	-	-	8.65	-	216.15
T35	6.36	0.37	0.17	-	-	-	-	-	-	-	-	4.55	-	113.82
T36	6.36	0.37	0.17	-	-	-	-	-	-	-	-	4.55	-	113.82
T37	6.36	0.37	0.17	-	-	-	-	-	-	-	-	4.55	-	113.82
T38	6.36	0.37	0.17	-	-	-	-	-	-	-	-	4.55	-	113.82
T39	6.36	0.37	0.17	-	-	-	-	-	-	-	-	4.55	-	113.82
T40	6.36	0.37	0.17	-	-	-	-	-	-	-	-	4.55	-	113.82
T41	10.56	0.64	0.27	-	-	-	-	-	-	-	-	12.88	-	322.00
T42	10.56	0.64	0.27	-	-	-	-	-	-	-	-	12.88	-	322.00
T43	10.56	0.64	0.27	-	-	-	-	-	-	-	-	12.88	-	322.00
T44	10.56	0.64	0.27	-	-	-	-	-	-	-	-	12.88	-	322.00
T45	10.56	0.64	0.27	-	-	-	-	-	-	-	-	12.88	-	322.00
ST01	1.02	3.84E-02	3.01E-02	-	-	-	-	-	-	-	-	2.76E-03	-	6.89E-02
ST02	0.30	1.11E-02	8.70E-03	-	-	-	-	-	-	-	-	3.15E-04	-	7.87E-03
ST03	0.50	8.00E-03	6.40E-03	-	-	-	-	-	-	-	-	3.15E-04	-	7.87E-03
ST04	0.11	4.16E-03	3.26E-03	-	-	-	-	-	-	-	-	1.18E-04	-	2.95E-03
ST05	0.30	1.11E-02	8.70E-03	-	-	-	-	-	-	-	-	3.15E-04	-	7.87E-03
ST06	0.07	2.77E-03	2.18E-03	-	-	-	-	-	-	-	-	7.87E-05	-	1.97E-03
FT01	9.51E-05	Negligible	Negligible	-	-	-	-	-	-	-	-	Negligible	-	Negligible
FT02	9.51E-05	Negligible	Negligible	-	-	-	-	-	-	-	-	Negligible	-	Negligible
PG01	1.41E-01	9.45E-03	3.48E-03	-	-	-	-	-	-	-	-	Negligible	-	Negligible
PG02	2.55E-03	2.68E-04	1.06E-04	-	-	-	-	-	-	-	-	Negligible	-	Negligible
PG03	8.88E-03	5.93E-04	2.19E-04	-	-	-	-	-	-	-	-	Negligible	-	Negligible
PG04	6.07E-03	4.06E-04	1.50E-04	-	-	-	-	-	-	-	-	Negligible	-	Negligible
PG05	6.07E-03	4.06E-04	1.50E-04	-	-	-	-	-	-	-	-	Negligible	-	Negligible
PG06	6.07E-03	4.06E-04	1.50E-04	-	-	-	-	-	-	-	-	Negligible	-	Negligible
PG07	6.07E-03	4.06E-04	1.50E-04	-	-	-	-	-	-	-	-	Negligible	-	Negligible
PG08	6.07E-03	4.06E-04	1.50E-04	-	-	-	-	-	-	-	-	Negligible	-	Negligible
PG09	6.07E-03	4.06E-04	1.50E-04	-	-	-	-	-	-	-	-	Negligible	-	Negligible
PG10	6.07E-03	4.06E-04	1.50E-04	-	-	-	-	-	-	-	-	Negligible	-	Negligible
PG11	3.74E-02	2.50E-03	9.20E-04	-	-	-	-	-	-	-	-	Negligible	-	Negligible
Tank Roof Landing Losses	76.53	2.87	2.25	-	-	-	-	-	-	-	-	0.14	-	3.50
Tank Cleaning Losses	43.10	1.62	1.27	-	-	-	-	-	-	-	-	-	-	-
Piping Fugitive Emissions	8.96	0.33	0.26	-	-	-	-	-	-	-	-	8.96	-	223.89
H01	4.07	6.84E-01	0.65	14.79	14.79	14.79	1.81E-04	2.17E-01	22.18	14.79	43,209.97	8.15E-01	8.15E-02	43,254.63
EN3	0.24	2.48E-03	-	0.20	0.20	0.20	-	1.02E-03	2.89	0.62	106.72	4.33E-03	8.66E-04	107.08
EG1	0.05	5.49E-04	-	0.04	0.04	0.04	-	2.32E-04	0.64	0.14	23.63	9.58E-04	1.92E-04	23.71
EG2	0.05	5.49E-04	-	0.04	0.04	0.04	-	2.32E-04	0.64	0.14	23.63	9.58E-04	1.92E-04	23.71
EG3	0.05	5.49E-04	-	0.04	0.04	0.04	-	2.32E-04	0.64	0.14	23.63	9.58E-04	1.92E-04	23.71
EG4	0.05	5.49E-04	-	0.04	0.04	0.04	-	2.32E-04	0.64	0.14	23.63	9.58E-04	1.92E-04	23.71
EG5	0.05	5.49E-04	-	0.04	0.04	0.04	-	2.32E-04	0.64	0.14	23.63	9.58E-04	1.92E-04	23.71
EG6	0.007	8.89E-04	-	0.006	0.006	0.006	-	4.13E-04	0.22	0.03	38.24	1.55E-03	3.10E-04	38.37
EG7	0.003	5.23E-04	-	0.003	0.003	0.003	-	2.15E-04	0.10	0.03	22.49	9.12E-04	1.82E-04	22.56
EG8	0.003	5.23E-04	-	0.003	0.003	0.003	-	2.15E-04	0.10	0.03	22.49	9.12E-04	1.82E-04	22.56
EG9	0.120	1.96E-03	-	0.046	0.046	0.046	-	2.28E-03	1.60	0.19	214.69	8.71E-03	1.74E-03	215.43
Facility-wide MTE Total[2]	447.28	22.62	12.87	15.27	15.27	15.27	1.81E-04	0.22	30.29	16.36	43,732.72	211.15	0.09	49,037.12
Facility-wide PTE Total[3]	447.28	<25	<10	15.27	15.27	15.27	1.81E-04	0.22	30.29	16.36	43,732.72	211.15	0.09	49,037.12
	VOC	Total Federal HAP	Highest Single HAP (n-Hexane)	PM	PM10	PM2.5	Lead	SO_2	NOx	CO	CO_2	CH_4	N_2O	CO_2e

s:
Refer to tables 2-2 through 2-11 for supporting calculations.
2. Facility-wide VOC emissions are conservatively over-estimated by 67 tpy as a result of the withdrawal loss emissions being over-estimated by 40% or 1,987,820 bbl/day. This over-estimation of the facility-wide throughput also result in an over-estimation of the total HAP and n-hexane emissions.
3. Enbridge has accepted synthetic minor permit limitations that limit actual total HAPs emissions to less than 25 tons per year and the actual n-hexane emissions to less than 10 tons per year.

Table 2-2
Enbridge Energy, Limited Partnership - Superior, WI Terminal
MTE/PTE Emission Calculations
Facility-Wide Volatile Organic Compound Emissions Summary

Emission Unit ID	Annual Tank Throughput[1] (bbl/yr)	Annual Tank Withdrawal (gal/yr)	Tank Turnovers[1]	Standing Loss[2] (lb VOC/yr)	Withdrawal/ Working Loss[2] (lb VOC/yr)	Roof Landing Loss[3] (lb VOC/yr)	Tank Degassing and Cleaning Loss[4] (lb VOC/yr)	Total Loss (lb VOC/yr)	Standing Loss[2] (ton VOC/yr)	Withdrawal/ Working Loss[2] (ton VOC/yr)	Roof Landing Loss[3] (ton VOC/yr)	Tank Degassing and Cleaning Loss[4] (ton VOC/yr)	Total Loss[1] (ton VOC/yr)
Storage Tanks													
T01	33,930,000	1,425,060,000	87	12,564	6,372			18,935	6.28	3.19	-	-	9.47
T02	33,930,000	1,425,060,000	87	24,883	6,372			31,255	12.44	3.19	-	-	15.63
T03	13,050,000	548,100,000	87	4,623	3,431			8,054	2.31	1.72	-	-	4.03
T04	13,050,000	548,100,000	87	4,451	3,431			7,882	2.23	1.72	-	-	3.94
T05	13,050,000	548,100,000	87	3,578	3,431			7,008	1.79	1.72	-	-	3.50
T06	30,000,000	1,260,000,000	200	3,502	7,887			11,389	1.75	3.94	-	-	5.69
T07	13,050,000	548,100,000	87	3,687	3,431			7,118	1.84	1.72	-	-	3.56
T08	13,050,000	548,100,000	87	11,160	3,431			14,591	5.58	1.72	-	-	7.30
T09	30,000,000	1,260,000,000	200	3,521	7,887			11,408	1.76	3.94	-	-	5.70
T10	30,000,000	1,260,000,000	200	3,508	7,887			11,395	1.75	3.94	-	-	5.70
T11	13,050,000	548,100,000	87	4,868	3,431			8,299	2.43	1.72	-	-	4.15
T12	13,050,000	548,100,000	87	6,198	3,431			9,629	3.10	1.72	-	-	4.81
T13	18,879,000	792,918,000	87	4,457	4,136			8,593	2.23	2.07	-	-	4.30
T14	43,400,000	1,822,800,000	200	4,215	9,509			13,723	2.11	4.75	-	-	6.86
T15	43,400,000	1,822,800,000	200	4,215	9,509			13,723	2.11	4.75	-	-	6.86
T16	18,879,000	792,918,000	87	4,072	4,136			8,208	2.04	2.07	-	-	4.10
T17	18,879,000	792,918,000	87	16,803	4,136			20,940	8.40	2.07	-	-	10.47
T18	43,400,000	1,822,800,000	200	4,215	9,509			13,723	2.11	4.75	-	-	6.86
T19	43,400,000	1,822,800,000	200	4,190	9,509			13,699	2.10	4.75	-	-	6.85
T20	18,879,000	792,918,000	87	16,942	4,136			21,078	8.47	2.07	-	-	10.54
T21	18,879,000	792,918,000	87	4,410	4,136			8,546	2.21	2.07	-	-	4.27
T22	18,879,000	792,918,000	87	4,180	4,136			8,316	2.09	2.07	-	-	4.16
T23	18,879,000	792,918,000	87	4,160	4,136			8,296	2.08	2.07	-	-	4.15
T24	18,879,000	792,918,000	87	4,193	4,136			8,329	2.10	2.07	-	-	4.16
T25	43,400,000	1,822,800,000	200	4,534	9,509			14,042	2.27	4.75	-	-	7.02
T26	43,400,000	1,822,800,000	200	1,041	9,509			10,549	0.52	4.75	-	-	5.27
T27	43,400,000	1,822,800,000	200	4,640	9,509			14,148	2.32	4.75	-	-	7.07
T28	18,879,000	792,918,000	87	11,992	4,711			16,703	6.00	2.36	-	-	8.35
T29	18,879,000	792,918,000	87	11,321	4,711			16,031	5.66	2.36	-	-	8.02
T30	50,000,000	2,100,000,000	200	5,244	9,859			15,103	2.62	4.93	-	-	7.55
T31	50,000,000	2,100,000,000	200	5,018	9,859			14,877	2.51	4.93	-	-	7.44
T32	36,571,429	1,536,000,000	200	4,047	8,741			12,787	2.02	4.37	-	-	6.39
T33	36,571,429	1,536,000,000	200	4,187	8,741			12,928	2.09	4.37	-	-	6.46
T34	78,433,600	3,294,219,600	200	5,886	13,809			19,694	2.94	6.90	-	-	9.85
T35	41,302,029	1,734,685,200	200	3,508	9,212			12,720	1.75	4.61	-	-	6.36
T36	41,302,029	1,734,685,200	200	3,508	9,212			12,720	1.75	4.61	-	-	6.36
T37	41,302,029	1,734,685,200	200	3,508	9,212			12,720	1.75	4.61	-	-	6.36
T38	41,302,029	1,734,685,200	200	3,508	9,212			12,720	1.75	4.61	-	-	6.36
T39	41,302,029	1,734,685,200	200	3,508	9,212			12,720	1.75	4.61	-	-	6.36
T40	41,302,029	1,734,685,200	200	3,508	9,212			12,720	1.75	4.61	-	-	6.36
T41	116,846,400	4,907,548,800	200	4,780	16,340			21,120	2.39	8.17	-	-	10.56
T42	116,846,400	4,907,548,800	200	4,780	16,340			21,120	2.39	8.17	-	-	10.56
T43	116,846,400	4,907,548,800	200	4,780	16,340			21,120	2.39	8.17	-	-	10.56
T44	116,846,400	4,907,548,800	200	4,780	16,340			21,120	2.39	8.17	-	-	10.56
T45	116,846,400	4,907,548,800	200	4,780	16,340			21,120	2.39	8.17	-	-	10.56
Tank Roof Landing Losses[5]						153,060		153,060			76.53		76.53
Tank Cleaning Losses[6]							86,200	86,200				43.10	43.10
Piping Fugitive Emissions[7]								17,911					8.96
Sump Tank Emissions[8]													
ST01	25,018	1,050,774	131	-	2,044			2,044	-	1.02	-		1.02
ST02	2,857	120,000	30	-	591			591	-	0.30	-		0.30
ST03	2,857	120,000	30	-	1,003			1,003	-	0.50	-		0.50
ST04	1,071	45,000	11	-	222			222	-	0.11	-		0.11
ST05	2,857	120,000	30	-	591			591	-	0.30	-		0.30
ST06	714	30,000	8	-	148			148	-	0.07	-		0.07
Pigging Equipment Emissions[9]													
PG01								283					0.141
PG02								5					0.003
PG03								18					0.009
PG04								12					0.006
PG05								12					0.006
PG06								12					0.006
PG07								12					0.006
PG08								12					0.006
PG09								12					0.006
PG10								12					0.006
PG11								75					0.037
Combustion Sources[10]													
H01								8,133					4.07
EN3								471					0.24
EG1								104					0.05
EG2								104					0.05
EG3								104					0.05
EG4								104					0.05
EG5								104					0.05
EG6								15					0.01
EG7								6					0.003
EG8								6					0.003
EG9								241					0.120
Diesel Engine Fuel Tank Emissions[11]													
FT01	64	2,700	8	0.14	0.05	-	-	0.19	7.19E-05	2.31E-05	-	-	9.51E-05
FT02	64	2,700	8	0.14	0.05	-	-	0.19	7.19E-05	2.31E-05	-	-	9.51E-05
			Total	265,453	362,070	153,060	86,200	894,552	132.73	181.04	76.53	43.10	447.28
		Modified Storage Tank Total[12]		83,009	196,501	-	-	279,510	41.50	98.25	-	-	139.75
		Non-modified Storage Tank Total[13]		182,444	160,970	-	-	343,414	91.22	80.49	-	-	171.71

Notes:

1. Previous PTE calculations for tanks T01 through T34 were based on the maximum terminal throughput which was equal to approximately 87 turnovers per tank per year. The PTE for tanks T35 through T45 and the existing project modified storage tanks (T06, T09, T10, T14, T15, T18, T19, T25, T26, T27, T30, T31, T32, T33, T34, T35, T36, T37, T38, T39 and T40) are based on a maximum number of 200 turnovers per year. These same maximum turnovers of 87 per tank for T01 through T34 (except for the modified tanks) are used here in calculating the facility-wide PTE. As a result, the facility-wide tank throughput is conservatively higher (5,001,153 bbl/day) than the potential throughput the terminal is physically capable of accommodating after the proposed Project (3,013,333 bbl/day) which conservatively results in an over-estimation of annual VOC emissions by 67 tpy.
2. Calculated using the methodology described in the EPA AP-42, Chapter 7.1, Organic Liquid Storage Tanks guidance document (EPA, Compilation of Air Pollutant Emission Factors, Volume 1, 5th edition, November 2006). Emissions are calculated based on a representative worst case vapor pressure for crude oil which could be stored in tankage. The vapor pressure is calculated using regression formulas based on ASTM- D6377 analytical results for the LSB crude type.
3. See Table 2-4A MTE/PTE Tank Roof Landing Emission Calculations. All storage tanks may have roof landing emissions. Enbridge will retain the existing permit limits on roof landing emissions consistent with operating permit 816010580-P16.
4. Potential tank cleaning losses are conservatively quantified for five tanks per year. Internal floating roof tanks are typically degassed and cleaned on a 10-year schedule and external floating roof tanks are typically degassed and cleaned on a 18-20 year schedule when the tanks are removed from service for API inspections. Enbridge has conservatively calculated tank cleaning emissions for five tank per year even though the cleaning emissions will not occur annually.
5. See Table 2-4A MTE/PTE Tank Roof Landing Volatile Organic Compound Emission Calculations
6. See Table 2-4B MTE/PTE Tank Cleaning Volatile Organic Compound Emission Calculations
7. See Table 2-5 Piping Component Fugitive Volatile Organic Compound Emission Calculations
8. See Table 2-9 MTE/PTE Sump Tank Emission Calculations
9. See Table 2-10 MTE/PTE Pigging Emission Calculations
10. See Tables 2-6 and 2-7 for the heater, fire pump, and emergency generators VOC emission calculations.
11. Area 5 and Line 3 generator diesel fuel tank emissions, calculated using US Environmental Protection Agency, TANKS program version 4.0.9d, see Table 2-7 for a summary of the emission calculations.
12. Existing modified storage tanks (T06, T09, T10, T14, T15, T18, T19, T25, T26, T27, T30, T31, T32, T33, T34, T35, T36, T37, T38, T39 and T40) which may realize an increased utilization as a result of the proposed pipeline throughput capacity increases and require the construction of one additional vacuum breaker per tank to accommodate the increased withdrawal rate from the tanks.
13. Existing non-modified project affected storage tanks which may realize an increased utilization as a result of the proposed pipeline throughput capacity increases. Includes the all terminal tanks not included as part of the modified storage tank group.

Table 2-3A
Enbridge Energy, Limited Partnership - Superior, WI Terminal
MTE Emission Calculations
Federal Hazardous Air Pollutant Emission Calculation Summary from Sources of VOC Emissions[1]

					Potential HAP Emissions (lb/yr)															
				Chemical →	Benzene	Biphenyl	Cumene/Isopropyl benzene	Cyclohexane	Ethylbenzene	n-Hexane	Isooctane/2,2,4-Trimethylpentane	Mercury	Naphthalene	PACs	Phenol	Toluene	1,2,4-Trimethylbenzene	Xylenes	Total HAP[4]
				Crude Oil Liquid Weight Fraction[2] →	6.00E-03	6.00E-04	1.00E-03	7.00E-03	4.00E-03	2.46E-02	1.00E-03	6.00E-06	2.19E-03	4.00E-06	3.23E-03	1.00E-02	3.30E-03	1.42E-02	
				Crude Oil Vapor Weight Fraction[3] →	4.43E-03	1.08E-07	3.23E-05	5.33E-03	2.75E-04	2.95E-02	3.78E-04	8.95E-11	3.31E-06	4.30E-08	6.85E-06	2.13E-03	4.61E-05	8.48E-04	
				Diluent Liquid Weight Fraction[2] →	1.25E-02				2.08E-02	4.16E-02			8.33E-04			8.33E-03		2.08E-02	
				Diluent Vapor Weight Fraction[3] →	2.25E-03				2.89E-04	1.28E-02			1.81E-07			3.96E-04		2.49E-04	
Emission Unit Description	Total Standing Loss (lb VOC/yr)	Total Withdrawal/ Working Loss (lb VOC/yr)	Roof Landing and Cleaning Loss (lb VOC/yr)	Total Loss (lb VOC/yr)	HAP	HAP	HAP		HAP	HAP	HAP	HAP	HAP	HAC	HAP	HAP	HAC	HAP	HAP
Tanks																			
T01	12,563.57	6,371.77		18,935	95.02	3.82	6.79	112.90	29.07	533.35	11.24	0.04	14.00	0.03	20.67	91.25	21.63	101.54	906.78
T02	24,883.18	6,371.77		31,255	156.62	3.83	7.21	179.79	32.57	902.03	16.00	0.04	14.04	0.03	20.76	118.19	22.23	112.36	1,377.64
T03	4,623.25	3,430.95		8,054	41.59	2.06	3.59	49.27	15.05	223.62	5.23	0.02	7.53	0.01	11.12	44.51	11.55	52.83	407.15
T04	4,451.47	3,430.95		7,882	40.81	2.06	3.58	48.34	15.00	218.45	5.16	0.02	7.53	0.01	11.12	44.13	11.54	52.68	400.55
T05	3,577.51	3,430.95		7,008	36.77	2.06	3.55	43.48	14.74	191.78	4.82	0.02	7.53	0.01	11.11	42.16	11.50	51.87	366.41
T06	3,501.53	7,887.25		11,389	63.17	4.73	8.01	74.27	32.55	299.30	9.24	0.05	17.29	0.03	25.50	86.56	26.20	115.09	661.49
T07	3,688.98	3,430.95		7,118	37.28	2.06	3.56	44.09	14.78	195.12	4.86	0.02	7.53	0.01	11.11	42.41	11.50	51.97	370.68
T08	11,160.03	3,430.95		14,591	71.01	2.06	3.81	84.66	16.90	418.77	7.75	0.02	7.55	0.01	11.16	58.75	11.86	58.54	656.32
T09	3,521.12	7,887.25		11,408	63.26	4.73	8.01	74.38	32.55	299.89	9.25	0.05	17.29	0.03	25.50	86.60	26.20	115.11	662.24
T10	3,508.06	7,887.25		11,395	63.20	4.73	8.01	74.31	32.55	299.50	9.25	0.05	17.29	0.03	25.50	86.57	26.20	115.10	661.74
T11	4,868.43	3,430.95		8,299	42.62	2.06	3.80	50.52	15.11	230.55	5.32	0.02	7.53	0.01	11.12	45.00	11.56	53.02	415.95
T12	6,198.39	3,430.95		9,629	48.57	2.06	3.64	57.68	15.49	270.05	5.83	0.02	7.54	0.01	11.13	47.87	11.62	54.17	466.36
T13	4,456.99	4,136.21		8,593	44.99	2.48	4.29	53.22	17.82	235.58	5.86	0.02	9.07	0.02	13.39	51.15	13.87	62.67	447.33
T14	4,214.59	9,508.52		13,723	76.13	5.71	9.65	89.51	39.24	360.64	11.14	0.06	20.84	0.04	30.74	104.34	31.58	138.74	797.23
T15	4,214.59	9,508.52		13,723	76.13	5.71	9.65	89.51	39.24	360.64	11.14	0.06	20.84	0.04	30.74	104.34	31.58	138.74	797.23
T16	4,072.21	4,136.21		8,208	43.25	2.48	4.27	51.12	17.71	224.03	5.72	0.02	9.07	0.02	13.39	50.30	13.85	62.33	432.58
T17	16,803.32	4,136.21		20,940	100.70	2.48	4.70	120.23	21.33	604.99	10.63	0.02	9.12	0.02	13.46	78.14	14.46	73.50	919.10
T18	4,214.59	9,508.52		13,723	76.13	5.71	9.65	89.51	39.24	360.64	11.14	0.06	20.84	0.04	30.74	104.34	31.58	138.74	797.23
T19	4,190.05	9,508.52		13,699	76.02	5.71	9.65	89.37	39.23	359.90	11.13	0.06	20.84	0.04	30.74	104.29	31.58	138.72	796.29
T20	16,941.71	4,136.21		21,078	101.33	2.48	4.71	120.99	21.36	609.14	10.69	0.02	9.12	0.02	13.48	78.44	14.47	73.63	924.41
T21	4,410.00	4,136.21		8,546	44.78	2.48	4.29	52.96	17.80	234.17	5.85	0.02	9.07	0.02	13.39	51.05	13.86	62.63	445.54
T22	4,180.13	4,136.21		8,316	43.74	2.48	4.28	51.71	17.74	227.28	5.76	0.02	9.07	0.02	13.39	50.54	13.85	62.42	436.73
T23	4,159.78	4,136.21		8,296	43.65	2.48	4.28	51.60	17.73	226.67	5.75	0.02	9.07	0.02	13.39	50.50	13.85	62.41	435.95
T24	4,193.11	4,136.21		8,329	43.80	2.48	4.28	51.78	17.74	227.67	5.76	0.02	9.07	0.02	13.39	50.57	13.85	62.44	437.22
T25	4,533.62	9,508.52		14,042	77.57	5.71	9.66	91.24	39.33	370.18	11.27	0.06	20.84	0.04	30.75	105.04	31.60	139.02	809.41
T26	1,040.92	9,508.52		10,549	61.78	5.71	9.54	72.25	38.33	265.52	9.91	0.06	20.83	0.04	30.72	97.38	31.43	135.95	675.73
T27	4,639.91	9,508.52		14,148	78.05	5.71	9.67	91.82	39.36	373.36	11.31	0.06	20.84	0.04	30.75	105.27	31.60	139.12	813.50
T28	11,992.12	4,710.68		16,703	82.75	2.83	5.12	98.49	22.29	476.87	9.38	0.03	10.36	0.02	15.31	73.57	16.13	77.55	776.06
T29	11,320.75	4,710.68		16,031	79.70	2.83	5.10	94.82	22.10	456.67	9.12	0.03	10.36	0.02	15.30	72.09	16.10	76.95	750.24
T30	5,243.54	9,859.07		15,103	82.89	5.92	10.04	97.56	40.93	400.13	11.89	0.06	21.61	0.04	31.88	110.10	32.79	144.63	880.08
T31	5,017.76	9,859.07		14,877	81.87	5.92	10.03	96.33	40.87	393.34	11.80	0.06	21.61	0.04	31.88	109.81	32.78	144.43	851.41
T32	4,046.58	8,740.85		12,787	70.76	5.24	8.88	83.21	36.12	336.66	10.31	0.05	19.16	0.04	28.26	96.29	29.04	127.69	739.42
T33	4,187.10	8,740.85		12,928	71.40	5.25	8.88	83.98	36.16	340.88	10.36	0.05	19.16	0.04	28.26	96.60	29.05	127.82	744.82
T34	5,885.84	13,808.64		19,694	109.49	8.29	14.01	128.70	56.92	516.65	16.09	0.08	30.26	0.06	44.65	151.01	45.85	201.28	1,148.71
T35	3,508.14	9,211.86		12,720	70.80	5.53	9.33	83.19	37.81	330.22	10.54	0.06	20.19	0.04	29.78	99.59	30.56	133.78	747.61
T36	3,508.14	9,211.86		12,720	70.80	5.53	9.33	83.19	37.81	330.22	10.54	0.06	20.19	0.04	29.78	99.59	30.56	133.78	747.61
T37	3,508.14	9,211.86		12,720	70.80	5.53	9.33	83.19	37.81	330.22	10.54	0.06	20.19	0.04	29.78	99.59	30.56	133.78	747.61
T38	3,508.14	9,211.86		12,720	70.80	5.53	9.33	83.19	37.81	330.22	10.54	0.06	20.19	0.04	29.78	99.59	30.56	133.78	747.61
T39	3,508.14	9,211.86		12,720	70.80	5.53	9.33	83.19	37.81	330.22	10.54	0.06	20.19	0.04	29.78	99.59	30.56	133.78	747.61
T40	3,508.14	9,211.86		12,720	70.80	5.53	9.33	83.19	37.81	330.22	10.54	0.06	20.19	0.04	29.78	99.59	30.56	133.78	747.61
T41	4,780.18	16,339.82		21,120	119.20	9.80	16.49	139.86	66.67	543.25	18.15	0.10	35.80	0.07	52.81	173.58	54.14	236.08	1,271.93
T42	4,780.18	16,339.82		21,120	119.20	9.80	16.49	139.86	66.67	543.25	18.15	0.10	35.80	0.07	52.81	173.58	54.14	236.08	1,271.93
T43	4,780.18	16,339.82		21,120	119.20	9.80	16.49	139.86	66.67	543.25	18.15	0.10	35.80	0.07	52.81	173.58	54.14	236.08	1,271.93
T44	4,780.18	16,339.82		21,120	119.20	9.80	16.49	139.86	66.67	543.25	18.15	0.10	35.80	0.07	52.81	173.58	54.14	236.08	1,271.93
T45	4,780.18	16,339.82		21,120	119.20	9.80	16.49	139.86	66.67	543.25	18.15	0.10	35.80	0.07	52.81	173.58	54.14	236.08	1,271.93
Tank Roof Landing Losses			153,060	153,060	677.49	1.66E-02	4.94	816.02	42.05	4,508.26	57.88	1.37E-05	0.51	6.59E-03	1.05	325.96	7.06	129.82	5,747.96
Tank Cleaning Losses			86,200	86,200	381.55	9.34E-03	2.78	459.57	23.68	2,538.95	32.60	7.71E-06	0.29	3.71E-03	0.59	183.58	3.98	73.11	3,237.14
Piping Fugitive Emissions				17,911	78.05	1.88E-03	0.56	92.46	4.93	518.14	6.56	1.55E-06	0.06	7.46E-04	0.12	37.17	0.80	14.85	660.44
Sump Tank Emissions																			
ST01	-	2,044		2,044	9.05	2.22E-04	6.60E-02	10.90	0.56	60.21	0.77	1.83E-07	6.78E-03	8.80E-05	1.40E-02	4.35	9.43E-02	1.73	76.77
ST02	-	591		591	2.62	6.41E-05	1.91E-02	3.15	0.16	17.41	0.22	5.29E-08	1.96E-03	2.54E-05	4.05E-03	1.26	2.73E-02	0.50	22.19
ST03	-	1,003		1,003	2.26	-	-	-	0.29	12.80	-	-	1.82E-04	-	-	0.40	-	0.25	16.00
ST04	-	222		222	0.98	2.40E-05	7.16E-03	1.18	0.06	6.53	0.08	1.98E-08	7.34E-04	9.54E-06	1.52E-03	0.47	1.02E-02	0.19	8.32
ST05	-	591		591	2.62	6.41E-05	1.91E-02	3.15	0.16	17.41	0.22	5.29E-08	1.96E-03	2.54E-05	4.05E-03	1.26	2.73E-02	0.50	22.19
ST06	-	148		148	0.65	1.60E-05	4.77E-03	0.79	0.04	4.35	0.06	1.32E-08	4.90E-04	6.36E-06	1.01E-03	0.31	6.81E-03	0.13	5.55
Pigging Emissions																			
PG01				282.8	1.70	0.17	0.28	1.98	1.13	6.97	0.28	1.70E-03	6.19E-01	1.13E-03	0.91	2.83	0.93	4.02	18.91
PG02				5.1	0.06	-	-	-	0.11	0.21	-	-	4.25E-03	-	-	0.04	-	0.11	0.54
PG03				17.8	0.11	0.01	0.02	0.12	0.07	0.44	0.02	1.07E-04	3.89E-02	7.10E-05	0.06	0.18	0.06	0.25	1.19
PG04				12.1	0.07	0.01	0.01	0.08	0.05	0.30	0.01	7.28E-05	2.66E-02	4.86E-05	0.04	0.12	0.04	0.17	0.81
PG05				12.1	0.07	0.01	0.01	0.08	0.05	0.30	0.01	7.28E-05	2.66E-02	4.86E-05	0.04	0.12	0.04	0.17	0.81
PG06				12.1	0.07	0.01	0.01	0.08	0.05	0.30	0.01	7.28E-05	2.66E-02	4.86E-05	0.04	0.12	0.04	0.17	0.81
PG07				12.1	0.07	0.01	0.01	0.08	0.05	0.30	0.01	7.28E-05	2.66E-02	4.86E-05	0.04	0.12	0.04	0.17	0.81
PG08				12.1	0.07	0.01	0.01	0.08	0.05	0.30	0.01	7.28E-05	2.66E-02	4.86E-05	0.04	0.12	0.04	0.17	0.81
PG09				12.1	0.07	0.01	0.01	0.08	0.05	0.30	0.01	7.28E-05	2.66E-02	4.86E-05	0.04	0.12	0.04	0.17	0.81
PG10				12.1	0.07	0.01	0.01	0.08	0.05	0.30	0.01	7.28E-05	2.66E-02	4.86E-05	0.04	0.12	0.04	0.17	0.81
PG11				74.7	0.45	0.04	0.07	0.52	0.30	1.84	0.07	4.48E-04	1.64E-01	2.99E-04	0.24	0.75	0.25	1.06	5.00
Diesel Engine Fuel Tank Emissions																			
FT01	0.14	0.05		0.19	Negligible														-
FT02	0.14	0.05		0.19	Negligible														-
Total (lb)	265,453	362,070	239,260	885,159	4,499.73	214.82	375.23	5,332.48	1,579.07	24,437.15	558.80	2.15	785.67	1.45	1,159.84	4,713.79	1,205.94	5,536.49	43,863
Total (ton)	132.73	181.04	119.63	442.58	2.25	0.11	0.19	2.67	0.79	12.22	0.28	0.00	0.39	0.0007	0.58	2.36	0.60	2.77	21.93

Table 2-3A Continued

HAP Emissions Summary for Sources of VOC Emissions

	Lb/yr	Ton/yr
Total HAPS[1]	43,663	21.93
Individual HAP with the Highest Emissions: n-Hexane[2]	24,437	12.22

Notes:

1. Previous PTE calculations for tanks T01 through T34 were based on the maximum terminal throughput which was equal to approximately 87 turnovers per tank per year. The PTE for tanks T35 through T45 and the existing project modified storage tanks (T06, T09, T10, T14, T15, T18, T19, T25, T26, T27, T30, T31, T32, T33, T34, T35, T36, T37, T38, T39 and T40) are based on a maximum number of 200 turnovers per year. These same maximum turnovers of 87 per tank for T01 through T34 (except for the modified tanks) are used here in calculating the facility-wide PTE. As a result, the facility-wide tank throughput is conservatively higher (5,001,153 bbl/day) than the potential throughput the terminal is physically capable of accommodating after the proposed Project (3,013,333 bbl/day) which conservatively results in an over-estimation of annual VOC emissions by 67 tpy which also makes the total HAP emissions conservatively higher.

2. Calculated per API Manual of Petroleum Measurement Standards Chapter 19.4 - Evaporative Loss Reference Information and Speciation Methodology, Third Edition, October 2012.
3. The crude oil HAP speciation calculations are calculated monthly with the VOC emission calculations based on crude oil chemical speciation data from the EPA's TANKS program crude oil chemical speciation profile and EPA EPCRA Section 313 industry guidance document for petroleum terminal and bulk storage facilities. Refer to the table below for diluent speciation vapor weight fraction calculations.
4. Total federal HAP emissions calculated based on terminal withdrawal loss emissions being calculated based on the maximum PTE calculation throughput capacity. Pollutants that are state hazardous air contaminants only (designated as HAC in the table) are not included in the calculation of the total HAP.

HAP Speciation Vapor Weight Fraction Calculations

Crude Oil

Data Source: TANKS 4.0.9d

Z_U M_i x_i P P_i y_i M_v Z_{vi}

Chemical Component	Liquid Weight Percent	Mole Weight	Moles	Liquid Mole Fraction	True Vapor Pressure	Partial Pressure	Vapor Mole Fraction	Vapor Mole Weight	Vapor Weight Fraction
n-Hexane	0.40%	86.18	0.0000	0.0096	2.1966	0.0211	0.0027		4.72E-03
Benzene	0.60%	78.11	0.0001	0.0159	1.3536	0.0215	0.0028		4.36E-03
Isooctane/2,2,4-Trimethylpentane	0.10%	114.23	0.0000	0.0018	0.6934	0.0013	0.0002		3.72E-04
Toluene	1.00%	92.14	0.0001	0.0225	0.3896	0.0088	0.0011		2.09E-03
Ethylbenzene	0.40%	106.17	0.0000	0.0078	0.1251	0.0010	0.0001		2.69E-04
Xylenes	1.40%	106.17	0.0001	0.0273	0.1088	0.0030	0.0004		8.17E-04
Cumene/Isopropyl benzene	0.10%	120.19	0.0000	0.0017	0.0586	0.0001	0.0000		3.14E-05
1,2,4-Trimethylbenzene	0.33%	120.19	0.0000	0.0057	0.0252	0.0001	0.0000		4.47E-05
Cyclohexane	0.70%	84.16	0.0001	0.0172	1.3982	0.0241	0.0031		5.25E-03
Crude Oil - Unspecified		207.00			7.7142			50	
Total	0.05								0.02

Data Source: EPCRA Section 313 Industry Guide Petroleum Terminal and Bulk Storage Facilities Table 3-4

Chemical Component	Liquid Weight Percent	Mole Weight	Moles	Liquid Mole Fraction	True Vapor Pressure	Partial Pressure	Vapor Mole Fraction	Vapor Mole Weight	Vapor Weight Fraction
Benzene	0.446%	78.11	0.0001	0.0118	1.3536	0.0160	0.0021		3.24E-03
Biphenyl	0.060%	154.21	0.0000	0.0008	0.0003	0.0000	0.0000		1.01E-07
Cyclohexane	0.700%	84.16	0.0001	0.0172	1.3982	0.0241	0.0031		5.25E-03
Ethylbenzene	0.348%	106.17	0.0000	0.0067	0.1251	0.0008	0.0001		2.32E-04
n-Hexane	2.463%	86.18	0.0003	0.0592	2.1966	0.1300	0.0168		2.90E-02
Naphthalene	0.219%	128.17	0.0000	0.0035	0.0027	0.0000	0.0000		3.16E-06
Phenol	0.323%	94.11	0.0000	0.0071	0.0037	0.0000	0.0000		6.43E-06
PACs	0.0004%	252.31	1.59E-08	3.28E-06	1.06E-10	3.49E-16	4.53E-17		2.28E-16
Toluene	0.878%	92.14	0.0001	0.0197	0.3896	0.0077	0.0010		1.84E-03
1,2,4-Trimethylbenzene	0.328%	120.19	0.0000	0.0056	0.0252	0.0001	0.0000		4.42E-05
Xylenes	1.420%	106.17	0.0001	0.0277	0.1088	0.0030	0.0004		8.29E-04
Mercury	0.0006%	200.59	0.0000	0.0000	0.0000	0.0000	0.0000		8.51E-11
Crude Oil - Unspecified		207.00			7.7142			50	
Total	0.07								4.05E-02

Diluent

Data Source: Enbridge Diluent MSDS dated 11/09/07. Liquid weight percent represents the high range concentration of each component, normalized to 100%.

Chemical Component	Liquid Weight Percent Normalized	Mole Weight	Moles	Liquid Mole Fraction	True Vapor Pressure	Partial Pressure	Vapor Mole Fraction	Vapor Mole Weight	Vapor Weight Fraction
Benzene	1.25%	78.11	0.0002	0.0147	0.8599	0.0097	0.0017		2.25E-03
Ethylbenzene	2.08%	106.17	0.0002	0.0180	0.0507	0.0009	0.0002		2.89E-04
Naphthalene	0.08%	128.17	0.0000	0.0006	0.0008	0.0000	0.0000		1.81E-07
n-Hexane	4.16%	86.18	0.0005	0.0444	1.1202	0.0498	0.0089		1.28E-02
Toluene	0.83%	92.14	0.0001	0.0083	0.1739	0.0014	0.0003		3.96E-04
Xylenes	2.08%	106.17	0.0002	0.0180	0.0437	0.0008	0.0001		2.49E-04
Diluent - Unspecified		92.00			5.8049			60	
Total	0.10								1.59E-02

Table 2-3A Continued

Liquid Surface Temperature for TVP Calculation		Crude Oil	Diluent
$T = T_{LA}$	Daily Liquid Surface Temperature, °R =	525.00	499.98
	Daily Liquid Surface Temperature, °F =	65.33	40.31
	Daily Liquid Surface Temperature, °C =	18.52	4.617
	Vapor Pressure, psia =	7.71	5.60
	Diluent RVP, psia =		15.00
	Diluent Distillation Slope =		3.00

Chemical	Antoine's coefficients[1]			True Vapor Pressure at Daily Average Liquid Surface Temperature for Crude Oil (psia)	True Vapor Pressure at Daily Average Liquid Surface Temperature for Diluent (psia)	Liquid Molecular Weight	Vapor Molecular Weight	Notes
	A	B	C					
1,2,4-Trimethylbenzene	7.04383	1573.267	208.564	0.0252	0.0089	120.1938		
Benzene	6.90565	1211.033	220.79	1.3538	0.6599	78.1134		
Cumene/Isopropyl benzene	6.93666	1460.793	207.777	0.0586	0.0222	120.1938		
Cyclohexane	6.8413	1201.531	222.647	1.3982	0.6932	84.1608		
Ethylbenzene	6.95719	1424.255	213.206	0.1251	0.0507	106.167		
Naphthalene	7.01065	1733.71	201.859	0.0027	0.0008	128.1732		
n-Hexane	6.87024	1168.72	224.21	2.1966	1.1202	86.1766		
Toluene	6.95464	1344.8	219.482	0.3896	0.1739	92.1402		
Xylenes	7.00908	1462.266	215.105	0.1088	0.0437	106.167		
Biphenyl	7.2454	1998.72	202.74	0.0003	0.0001	154.211		
Phenol	7.1345	1516.07	174.57	0.0037	0.0009	94.1128		
Isooctane/2,2,4-Trimethylpentane	6.81189	1257.840	220.735	0.6934	0.3286	114.2302		
Mercury	8.45792	3601.314	299.5542	2.64E-05	0.000008	200.59		
PACs				1.06E-10	1.06E-10	252.31		Assumes vapor pressure for benzo(a)pyrene; from IWAIR Technical Background Document Page B-5, See note 2 below.
Diluent - Unspecified	11.5999	4937.931			5.60	92	60	AP-42 Table 7.1-2 and Figure 7.1-15
Crude Oil - Unspecified	10.84	4776.64		7.71		207	50	Annual average calculated from all monthly vapor pressures calculated for the tanks.

Notes:

1. Source of data: Yaws and Yang (Yaws, C. L. and Yang, H. C., "To estimate vapor pressure easily*Hydrocarbon Processing* , October, 1989, page 65.)

2. Polycyclic Aromatic Compounds (PACs) as a group of chemical compound that include: benz(a)anthracene, benzo (b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, benzo(rst)pentaphene, benzo(a)phenanthrene, benzo(a)pyrene, dibenz(a,h)acridine, dibenz(a,j)acridine, dibenzo(a,h)anthracene, 7H-Dibenzo(c,g)carbazole, dibenzo(a,e)fluoranthene, dibenzo(a,e)pyrene, dibenzo(a,h)pyrene, dibenzo(a,l)pyrene, 7,12-dimethylbenz(a)anthracene, indeno[1,2,3-cd]pyrene, 5-methylchrysene and 1-nitropyrene. For emission calculation and compliance demonstration purposes, benzo(a)pyrene a PAC listed in NR445.07 Table A is used as a surrogate for all PACs.

Table 2-3B
Enbridge Energy, Limited Partnership - Superior, WI Terminal
MTE/PTE Emission Calculations
Hazardous Air Contaminant and Hazardous Air Pollutant Emission Summary for Combustion Sources

	Potential Hazardous Air Contaminant and Hazardous Air Pollutant Emissions[1] (lb/yr)														
Chemical →	Acetaldehyde	Acrolein	Ammonia	Arsenic	Barium	Benzene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Beryllium	1,3-Butadiene	Cadmium	Chromium	Cobalt
Emission Unit ID	HAP	HAP	HAC	HAP	HAC	HAP	HAC	HAC	HAC	HAC	HAP	HAP	HAP	HAP	HAP
Combustion Sources															
H01			355.17	0.14	3.19	1.52	1.30E-03	8.70E-04	1.30E-03	1.30E-03	0.009		0.80	1.01	0.06
EN3	1.00	0.12				1.22	2.20E-03	2.46E-04	1.30E-04	2.03E-04		0.05			
EG1	0.22	0.03				0.27	4.87E-04	5.45E-05	2.87E-05	4.49E-05		0.01			
EG2	0.22	0.03				0.27	4.87E-04	5.45E-05	2.87E-05	4.49E-05		0.01			
EG3	0.22	0.03				0.27	4.87E-04	5.45E-05	2.87E-05	4.49E-05		0.01			
EG4	0.22	0.03				0.27	4.87E-04	5.45E-05	2.87E-05	4.49E-05		0.01			
EG5	0.22	0.03				0.27	4.87E-04	5.45E-05	2.87E-05	4.49E-05		0.01			
EG6	0.36	0.04				0.44	7.88E-04	8.82E-05	4.65E-05	7.27E-05		0.02			
EG7	0.21	0.03				0.26	4.63E-04	5.19E-05	2.73E-05	4.27E-05		0.01			
EG8	0.21	0.03				0.26	4.63E-04	5.19E-05	2.73E-05	4.27E-05		0.01			
EG9	0.07	0.02				2.04	1.64E-03	6.77E-04	2.92E-03	5.74E-04					
Total (lb)	2.96	0.37	355.17	0.14	3.19	7.09	9.29E-03	2.26E-03	4.60E-03	2.46E-03	0.009	0.15	0.80	1.01	0.06
Total (ton)	1.48E-03	1.85E-04	0.18	7.25E-05	1.59E-03	3.55E-03	4.65E-06	1.13E-06	2.30E-06	1.23E-06	4.35E-06	7.39E-05	3.99E-04	5.07E-04	3.04E-05

Notes:
1. See Tables 2-6 for the heater emission calculations and Table 2-7 for the diesel engine emission calculations.

Table 2-3B Continued

	Potential Hazardous Air Contaminant and Hazardous Air Pollutant Emissions (lb/yr)													
Chemical →	Copper	Dibenz(a,h)anthracene	Formaldehyde	n-Hexane	Indeno(1,2,3-cd)pyrene	Manganese	Mercury	Molybdenum	Naphthalene	Nickel	Nitrous oxide	Toluene	Xylenes	Total HAP
Emission Unit ID	HAC	HAC	HAP	HAP	HAC	HAP	HAP	HAC	HAP	HAP	HAC	HAP	HAP	HAP
Combustion S														
H01	0.62	8.70E-04	54.36	1,304.71	1.30E-03	0.28	0.19	0.80		1.52	162.99	2.46		1,367.07
EN3		7.63E-04	1.54		4.91E-04				0.11		1.73	0.54	0.37	4.96
EG1		1.69E-04	0.34		1.09E-04				0.02		0.38	0.12	0.08	1.10
EG2		1.69E-04	0.34		1.09E-04				0.02		0.38	0.12	0.08	1.10
EG3		1.69E-04	0.34		1.09E-04				0.02		0.38	0.12	0.08	1.10
EG4		1.69E-04	0.34		1.09E-04				0.02		0.38	0.12	0.08	1.10
EG5		1.69E-04	0.34		1.09E-04				0.02		0.38	0.12	0.08	1.10
EG6		2.73E-04	0.55		1.76E-04				0.04		0.62	0.19	0.13	1.78
EG7		1.61E-04	0.33		1.03E-04				0.02		0.36	0.11	0.08	1.05
EG8		1.61E-04	0.33		1.03E-04				0.02		0.36	0.11	0.08	1.05
EG9		9.11E-04	2.08E-01		1.09E-03				0.34		3.48	0.74	0.51	3.93
Total (lb)	0.62	3.98E-03	59.03	1,304.71	3.81E-03	0.28	0.19	0.80	0.66	1.52	171.48	4.75	1.59	1,385.32
Total (ton)	3.08E-04	1.99E-06	2.95E-02	0.65	1.91E-06	1.38E-04	9.42E-05	3.99E-04	3.31E-04	7.61E-04	0.09	2.37E-03	7.93E-04	0.69

Attachment G

Enbridge, September 2020 Investor Day Presentation Page 42

Resilience Discipline Growth

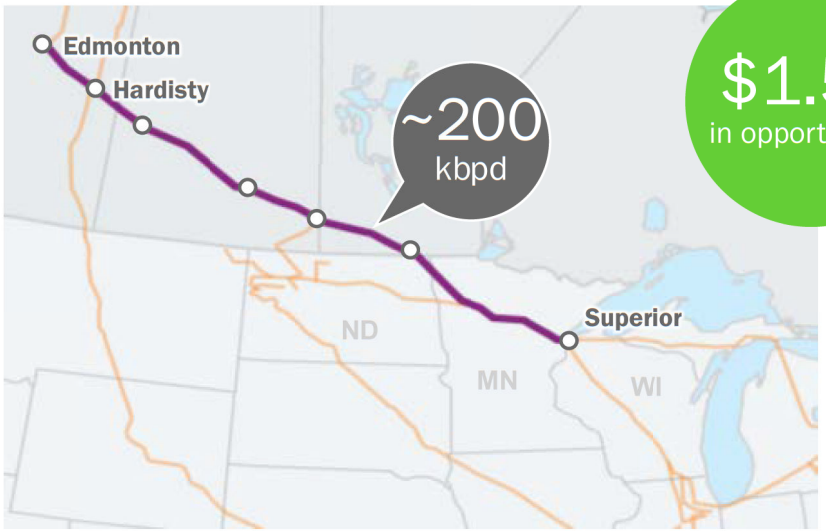
Enbridge Inc. (TSX: ENB; NYSE: ENB)

Investment Community Presentation
September 2020

Grow Organically

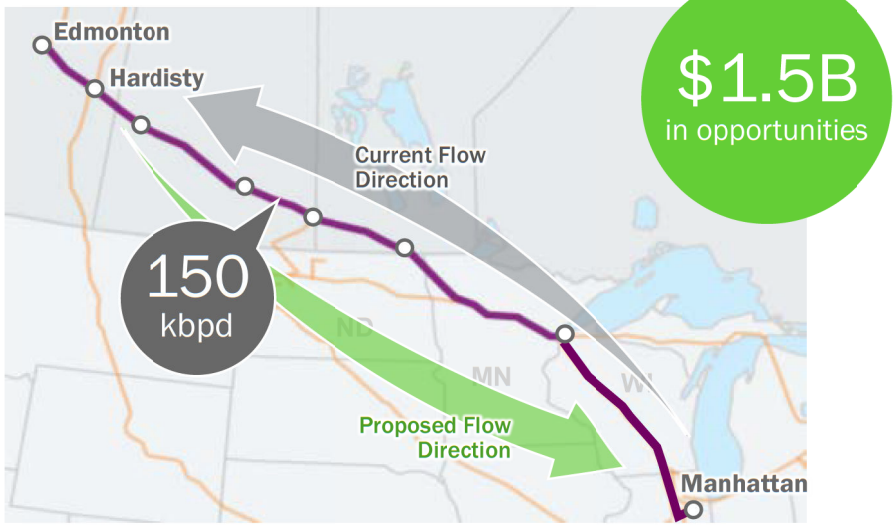
2 Potential WCSB Export Capacity Additions

Further Mainline Enhancements



- System optimization and enhancements post-2021
- ~200kbpd of incremental throughput

Southern Lights Reversal



- Condensate supply /demand fundamentals in WCSB expected to reduce requirement for imported supply
- Reverse and convert to crude oil export service, dependent upon WCSB, condensate energy is needed

Additional executable WCSB export capacity alternatives subject to future shipper demand